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Research Article

More Than a Tomb? Rethinking the Purpose of the Vratnica Tumulus in Bosnia through Spatial Geometry and Energetic Signatures

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Abstract

The Vratnica Tumulus, located in the village of Vratnica, Visoko municipality, central Bosnia- Herzegovina, presents an enigmatic structure that challenges conventional interpretations of prehistoric burial mounds. This study integrates archaeological excavation data, ground- penetrating radar (GPR) profiles, material composition analysis, and spatial geometry to propose that the tumulus may have served purposes beyond funerary use. Notable findings include a continuous 28.4 kHz electromagnetic emission, deep structural anomalies consistent with engineered voids or chambers, and alignment with a golden ratio spiral originating from the Ravne Tunnel complex. Microscopic analysis of core-drilled samples revealed calcium- potassium geopolymer cement, indicating ancient artificial construction techniques. These observations suggest that the tumulus was part of a larger, intentionally designed energetic and geometric complex. The paper calls for a reconsideration of tumuli as multidimensional structures incorporating energetic, geometric, and potentially astronomical functions.

Keywords: Vratnica Tumulus; GPR; Schumann Resonance; Tumuli; Energetic Fields; Spatial Geometry

Introduction

The Vratnica Tumulus, located in the village of Vratnica within the Visoko municipality of central Bosnia-Herzegovina, is a prominent conical mound rising approximately 32 meters above the surrounding terrain. Its form, location, and internal features have prompted multidisciplinary inquiry. Although initial interpretations categorized the tumulus as a traditional burial structure from the prehistoric period, subsequent geophysical and archaeological investigations have identified anomalies that challenge this classification.

Across Europe and the Near East, numerous tumuli have been documented as prehistoric burial mounds. In countries such as Bulgaria, Macedonia, Serbia, Hungary, and Romania, these structures often contain grave goods, human remains, and artifacts that affirm their funerary function. However, certain monumental tumuli deviate from this pattern, lacking definitive evidence of burial purposes and exhibiting features that suggest alternative functions.

One notable example is Silbury Hill in Wiltshire, England-the largest prehistoric man-made mound in Europe. Despite extensive excavations, no burial chamber or significant artifacts have been found within the mound. Its precise purpose remains a subject of debate, with some researchers proposing that it may have served as a ceremonial or astronomical site, possibly designed to resonate with specific acoustic frequencies.

In the Near East, Herodium in Israel presents another intriguing case. Constructed under the direction of King Herod the Great, this

artificial hill encompasses a palace-fortress complex. Archaeologist Ehud Netzer identified a mausoleum structure on the slope of Herodium, believed to be Herod's tomb. However, the absence of human remains and the fragmented state of the sarcophagus have led to ongoing discussions regarding the site's true function and the final resting place of the king [1].

Similarly, Mount Nemrut in southeastern Turkey features a 50-meter-high tumulus atop a mountain, flanked by colossal statues and terraces. Built by King Antiochus I of Commagene in the 1st century BCE, the site is thought to be a royal tomb. Yet, excavations have not conclusively identified a burial chamber, and the tumulus's inaccessibility has fueled theories about its symbolic or ritualistic significance [2].

These examples underscore the complexity of interpreting tumuli, as their purposes may extend beyond mere burial sites. The convergence of architectural sophistication, astronomical alignments, and the absence of typical funerary elements in some tumuli suggest that they may have served multifaceted roles, potentially encompassing ceremonial, spiritual, or astronomical functions.

In light of these considerations, the Vratnica Tumulus warrants a comprehensive analysis that transcends traditional archaeological interpretations. This study integrates archaeological excavation data, ground-penetrating radar (GPR) profiles, material composition analysis, and spatial geometry to explore the possibility that the tumulus may have served purposes beyond funerary use. Notable findings include a continuous 28.4 kHz electromagnetic emission, deep structural anomalies consistent with engineered voids or chambers, and alignment with a golden ratio spiral originating from the Ravne Tunnel complex. Microscopic analysis of core-drilled samples revealed calcium-potassium geopolymer cement, indicating ancient artificial construction techniques. These observations suggest that the tumulus was part of a larger, intentionally designed energetic and geometric complex. The paper calls for a reconsideration of tumuli as multidimensional structures incorporating energetic, geometric, and potentially astronomical functions.

Archaeological and geomorphological characteristics of the vratnica tumulus

The Vratnica Tumulus presents a distinct geomorphological profile that sets it apart from surrounding natural hills. It features a near-conical form with uniform slopes and a summit that rises 32 meters above the base. (Figure 1) Archaeological trenching conducted on multiple flanks of the tumulus revealed the presence of large sandstone blocks, some exceeding 20 tons in estimated mass. These blocks exhibit angular shaping and patterned alignment, suggesting deliberate placement rather than natural deposition.

Two principal excavation zones-Trench 1 and Trench 2-provided the most substantial data. Trench 1 exposed a pavement-like surface of sandstone leading toward the core of the structure (Figure 2), while Trench 2 revealed megalithic blocks arranged in a subhorizontal pattern, resembling retaining or load-bearing walls (Figure 3-4). The arrangement and scale of these elements have no direct parallels among typical prehistoric burial mounds of the region. One artifact discovered beneath a compacted clay layer resembles a human foot in form and size, carved in sandstone and possibly used as a mold or symbolic representation (Figure 5). Another sandstone tool-like object, shaped to fit the right hand, suggests the presence of human activity possibly related to the tumulus' construction or later ritual use (Figure 6,7).

Geomorphological observations, in combination with stratigraphic studies and excavation data, point toward a modified or entirely artificial origin. Soil layering on the tumulus' exterior is shallow and discontinuous, and core drilling has revealed consolidated material below the surface inconsistent with natural sedimentation. Notably, a core sample taken at 54 meters depth revealed a solid artificial block composed of calcium-potassium geopolymer cement-an indication of purposeful material engineering [3-12].

The tumulus occupies a key position within the surrounding topography and appears aligned along lines that correspond with known energetic and geometric configurations in the Visoko region. Taken together, these characteristics suggest the Vratnica Tu-

Figure 1: The Vratnica Tumulus, Bosnia-Herzegovina: Ground Views and Geospatial Context.

This figure presents the Vratnica Tumulus, located near Visoko in central Bosnia-Herzegovina, from both terrestrial and aerial perspectives. The top two photographs show the tumulus from the southwest, captured during different seasons. The structure reveals a pronounced conical geometry with a regular slope and clearly visible terraces and excavation zones. Vegetation growth in the lower image emphasizes the persistence of the tumulus' form over time, while also suggesting limited anthropogenic disturbance.

The third image is a cadastral map overlaid on satellite imagery, highlighting property boundaries and the precise footprint of the tumulus within parcel 973. Notably, the tumulus exhibits a 270-degree arc and continues into the neighboring hill, suggesting intentional integration with the surrounding landscape. This geometric continuation, aligned with the broader spatial design of the Visoko Valley, invites interpretations beyond conventional funerary functions and introduces the possibility of a larger architectural or symbolic layout.

The map confirms the tumulus' artificiality, regularity, and significant deviation from typical topographic formations in the region.

Source: Pyramids around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 233; cadastral base map obtained from the Municipality of Visoko, Bosnia and Herzegovina (official geospatial registry), showing parcel orientation and topographical contours relevant to the tumulus in Vratnica.

mulus may be a non-natural construction with architectural, energetic, and possibly symbolic or communicative functions.

All archaeological, geophysical, and research activities related to the Vratnica Tumulus from 2006 to 2025 have been carried out under the supervision and coordination of the Archaeological Park Foundation. The work has been conducted with official authorization from the Government of Zenica-Doboj Canton and the Ministry for Spatial Planning (Ministarstvo za prostorno uređenje), in compliance with relevant heritage and scientific regulations.

Figure 2: Archaeological Trench 1 on the Vratnica Tumulus: Exposure of Sandstone Pavement.

This figure documents the excavation of Trench 1 on the Vratnica Tumulus during archaeological campaigns led by the Archaeological Park Foundation. The upper-left image shows volunteers engaged in stratigraphic excavation, carefully revealing flat stone surfaces. The upper-right photo captures public interest and accessibility, illustrating the trench's significance and the clear stratification of the uncovered layers.

The lower image presents a panoramic view of the sandstone pavement discovered at the base of the trench. These megalithic sandstone plates, some over 2 meters in length, appear intentionally laid and leveled, forming a platform or pathway that leads toward the tumulus structure. Their orientation and regularity suggest premeditated architectural planning, supporting interpretations of the tumulus as more than a burial site. The stone surface has remained largely preserved, protected beneath topsoil and forest cover, until its recent archaeological exposure.

Source 2: Author's photo documentation taken during archaeological excavation at Trench 1 on the Vratnica tumulus.

Figure 3: Trench 2 on the Vratnica Tumulus: Exposure of Megalithic Construction Elements.

This figure presents multiple views of Trench 2 excavations on the Vratnica Tumulus, revealing large megalithic sandstone blocks that are part of a sophisticated structural system. The upper- left image shows excavation activities uncovering massive, tightly fitted stone slabs with clear- cut edges and horizontal alignment. The upper-right image focuses on the dimensions and massiveness of individual blocks, some of which measure over 4 meters in length and are estimated to weigh up to 24 tons.

The lower-left image features participants of the First International Conference on the Bosnian Pyramids (ICBP), held in August 2008, including archaeologists, Egyptologists, geologists, and other researchers from 15 countries, who visited the site to examine the findings firsthand. The lower-right photo captures surface finishing and tooling patterns on the stone blocks, suggesting intentional design and advanced construction techniques. These features raise significant

questions about the tumulus's original purpose, potentially extending beyond that of a traditional burial mound.

Source: Osmanagich, S. Pyramids around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 233

Figure 4: Detail of Megalithic Blocks: Angularity and Precision in Construction.

This figure highlights structural and morphological features of the sandstone megaliths excavated at the Vratnica Tumulus. The top-left image presents a massive rectangular block partially unearthed in Trench 2, demonstrating sharp linear edges and a smooth upper surface, suggestive of deliberate shaping. The top-right image shows two adjacent blocks separated by a narrow, consistent gap-indicating precision placement and minimal erosion at the joints, unusual for assumed natural formations the bottom-left photograph reveals a polygonal block with pronounced angularity and near- symmetrical geometry. The consistency in form and finish across the blocks supports the hypothesis of intentional quarrying and architectural planning. These characteristics strengthen the interpretation of the tumulus as a complex, engineered structure, rather than a mere prehistoric burial mound.

Source: Same as previous - Author's photo documentation during the 2008 ICBP Conference, Trench 2 excavations on the Vratnica tumulus.

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Figure 5: Sculpted Foot Artifact from Trench 2, Discovered in 2006.

This sandstone artifact, unearthed during the 2006 excavation of Trench 2 at the Vratnica Tumulus, resembles a stylized human foot, approximately European size 36 (US size 8). It was found beneath a consolidated layer of soil and clay, indicating significant age-likely dating back to Neolithic times, providing a minimum chronological reference for human presence at the site.

The function of the object remains speculative. While its form is anatomically suggestive, one plausible interpretation is that it served as a mold for crafting footwear. Although it may not be directly associated with the original builders of the tumulus, its presence reinforces the idea of prehistoric activity and craftsmanship in the wider Visoko Valley complex.

Source: *Osmanagich, S. Pyramids* around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 389.

Figure 6: Sandstone Tool Discovered Beneath Soil and Clay Layer (2007).

Unearthed in 2007 during excavation of the Vratnica Tumulus, this anatomically contoured sandstone artifact was found beneath a sealed layer of soil and clay. Its ergonomic shape suggests it was designed to fit the right human hand, possibly serving as a multifunctional Neolithic tool. Though its exact purpose remains speculative, its discovery confirms the presence of human activity in the area during prehistoric times and contributes to the broader archaeological context of the site.

Source: *Osmanagich, S*. Pyramids around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 234.

Figure 7: Detection of a 28 kHz Energy Beam at the Apex of the Vratnica Tumulus (April 12, 2010).

Physicist Slobodan Mizdrak from Zagreb, Croatia, conducted systematic measurements atop the Vratnica Tumulus and confirmed the presence of a stable, continuous electromagnetic beam centered at 28 kHz. The measurements were performed using high-precision, calibrated scientific instruments, including:

- Gaussmeter EMF 823 with internal probe
- EMF 828 with external 3D probe
- Oscilloscope
- Spectrometer

The detection range spanned frequencies from 10-50 Hz, 20-40 kHz, 1.1-1.8 GHz, and 2.5-3.1+ GHz. The discovery of a coherent energy emission from a prehistoric structure opens up new inquiries into the function and technological capabilities of ancient builders, suggesting the possibility of intentional energetic design embedded within the tumulus.

Source: Osmanagich, S. Pyramids around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 253.

Geophysical investigations and subsurface anomalies

Geophysical surveys carried out on the Vratnica Tumulus have yielded a wealth of data indicating the presence of subsurface features inconsistent with natural sedimentary formation. The primary tool used for these investigations has been ground-penetrating radar (GPR), complemented by electromagnetic field measurements and core drilling. Multiple GPR scans have revealed horizontally layered anomalies, linear high-reflectivity zones, and vertically aligned structures suggestive of buried architectural components (Figure 8-21).

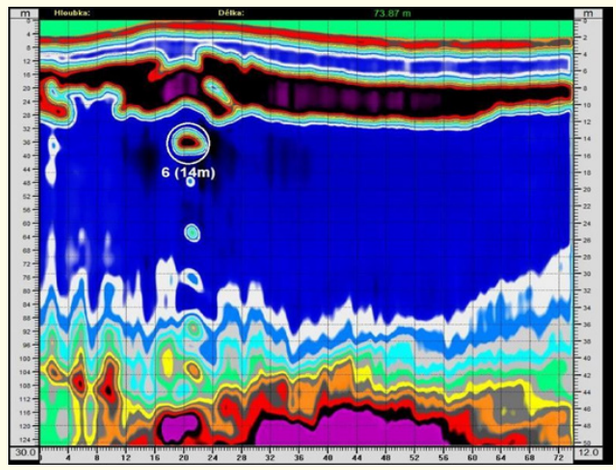

Figure 8: Ground Penetrating Radar (GPR) scan conducted in July 2023 by the Czech geophysical team (RTG PR, 25 MHz antenna) on the Vratnica Tumulus.

The scan reveals a clear, well-defined anomaly at 14 meters depth, labeled "6," which presents characteristics of a potential chamber-noted for its concentric, high-intensity reflection pattern. Additionally, vertically aligned reflective points directly beneath this anomaly suggest a possible access corridor or shaft. Secondary reflection zones-particularly in the lower right quadrant and lower central region-indicate the presence of denser, potentially structured materials at greater depths (between 90-120 ns), which may represent foundational layers or additional architectural features. This scan supports the hypothesis of internal structuring within the tumulus beyond simple geological formations.

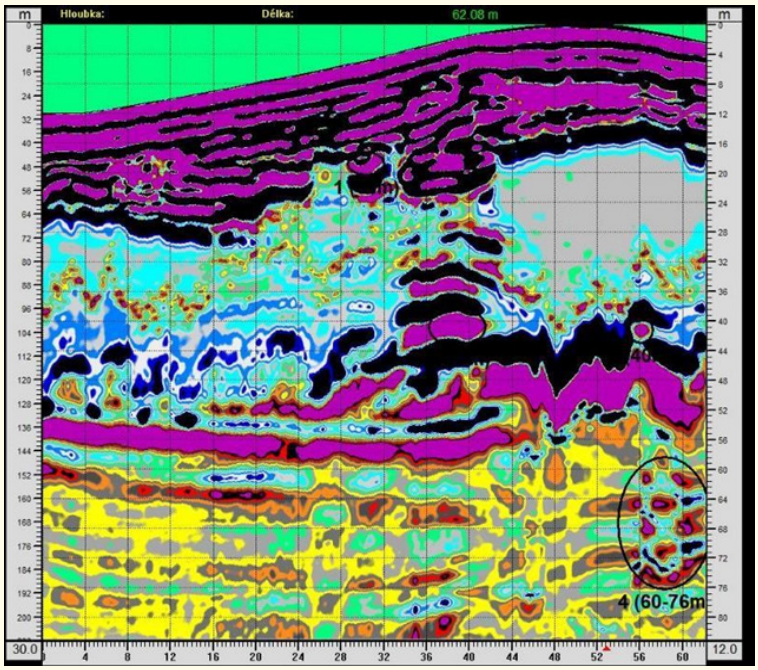

Figure 9: GPR scan of the Vratnica Tumulus using a 25 MHz antenna, conducted by the Czech team (RTG PR) in July 2023. The scan highlights a clustered, oval anomaly at depths between 60-76 meters, labeled "4," and marked on the lower right portion of the image. This anomaly exhibits strong reflectivity, compact internal patterning, and structural coherence, suggesting the possibility of an embedded object or feature, such as a stone vault, void, or chamber segment.

Additional points of interest include

- Horizontal stratification in the upper 40 meters (0-80 ns), with undulating banding (purple/black) typical of sediment layering.
- A central zone of disrupted reflectivity (approx. 40-60 m on the X-axis, 88-144 ns in depth), where reflections are broken and irregular, possibly indicating architectural
- disturbance, filled cavities, or denser material transitions.
- Concentric and nested anomalies visible on the left-center side (approx. 10-20 m, around 140-160 ns) that could point to pillar-like or columnar features-though less defined than the anomaly labeled "4."

The cumulative signature supports the interpretation of internal complexity within the tumulus-suggesting anthropogenic structuring beyond typical geological layering.

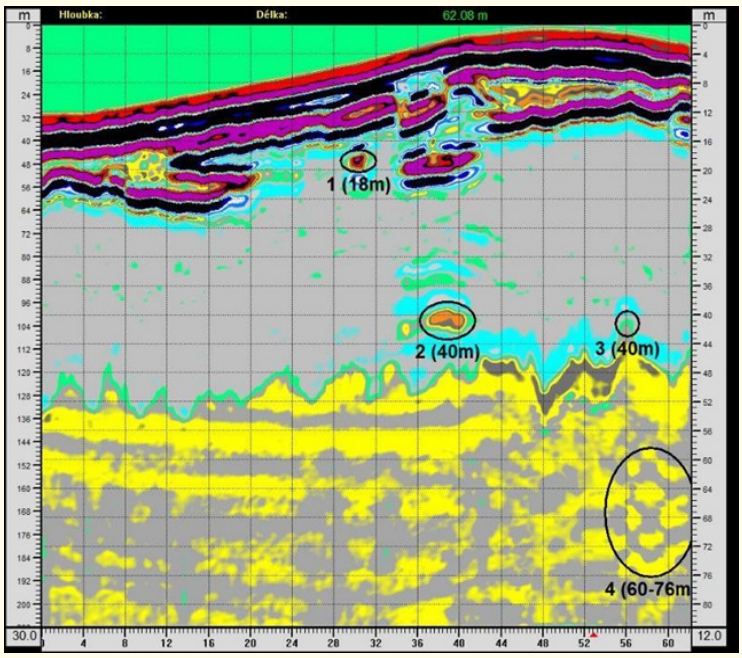

Figure 10: Ground Penetrating Radar (GPR) scan of the Vratnica Tumulus, recorded in July 2023 with a 25 MHz antenna by RTG PR (Czech Republic). The scan reveals multiple subsurface anomalies, each marked and annotated:

- Anomaly 1 (18 m depth): A compact and highly reflective feature, suggestive of a dense object or cavity near the upper layers, possibly associated with anthropogenic layering.
- Anomaly 2 (40 m depth): A well-bounded, horizontally oval anomaly with a strong radar return, indicating the potential presence of an artificial cavity or structural chamber.
- Anomaly 3 (40 m depth): Smaller in scale but with sharply defined margins and contrast, indicating another potential internal feature or void.
- Anomaly 4 (60-76 m depth): A deeper, vertically elongated cluster with layered texture and stronger echo zones, interpreted as a possible underground chamber or vault-like structure, consistent with known megalithic void signatures.

The layered reflections, color variation, and distinctive shapes of these anomalies provide evidence of complex subsurface architecture not consistent with natural stratigraphy alone.

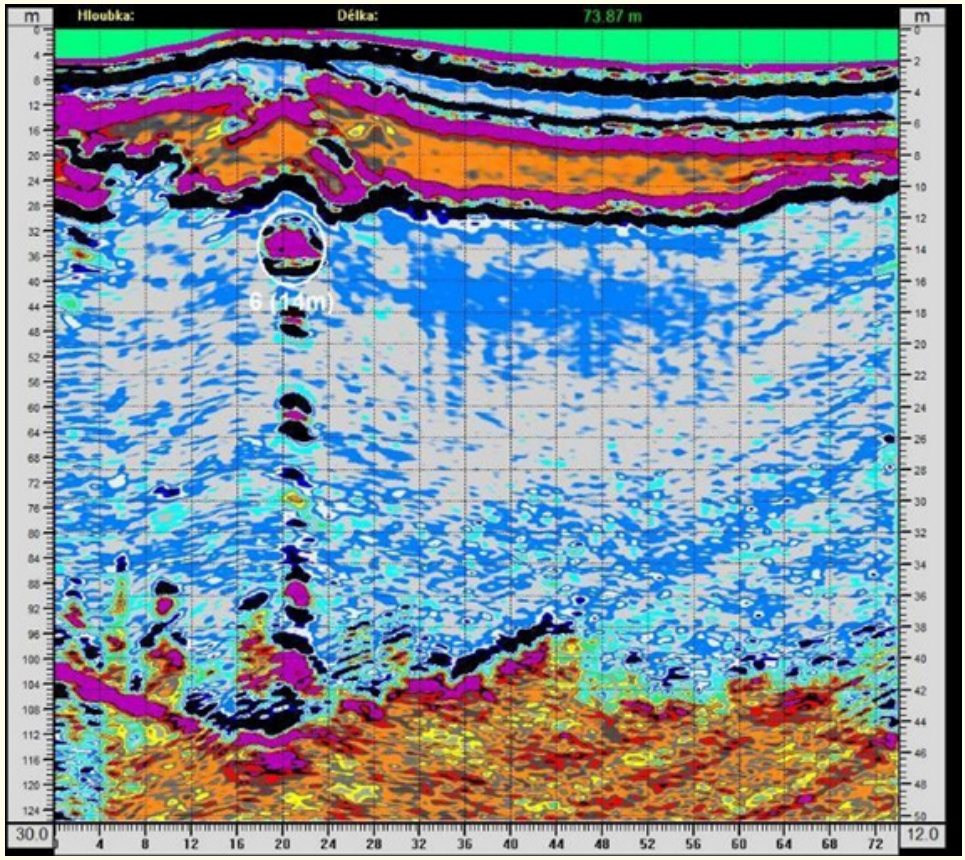

Figure 11: Ground Penetrating Radar (GPR) profile of the Vratnica Tumulus (scan length: 73.87 m), collected with a 25 MHz antenna by RTG PR in July 2023. The image highlights a significant circular anomaly at 14 meters depth labeled as Anomaly 6 (14 m)-a feature interpreted as a potential chamber or artificial void.

This particular anomaly appears prominently as a symmetrical, high-contrast reflection surrounded by concentric signal returns, suggesting a bounded structure of different dielectric properties than the surrounding matrix. The vertical column of sequential reflections beneath it suggests either a shaft-like connection or a stacked internal feature descending into deeper layers.

The horizontal banding and strong signal attenuation in the upper 10 meters are consistent with compacted fill or constructed layering. Below 100 meters (in radar time scale, ~44-46 meters depth), increasing signal scattering and intense reflectivity (in red and magenta) may indicate dense material changes or stone assemblages consistent with substructural complexity.

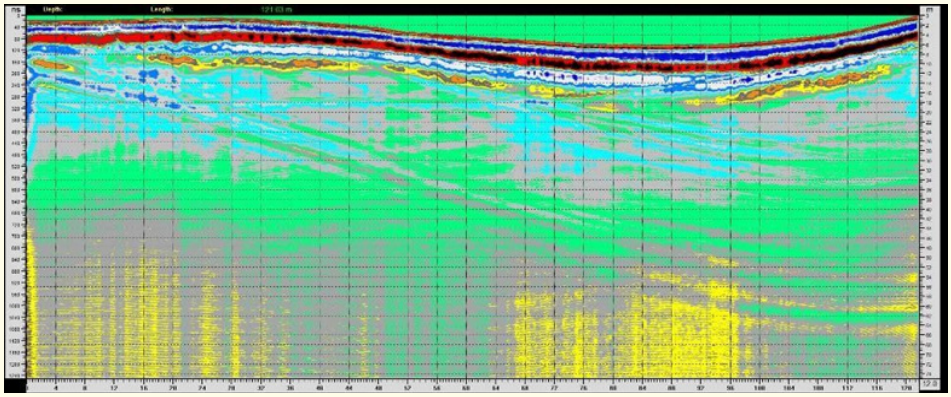

Figure 12: Ground Penetrating Radar (GPR) scan (121.63 m profile length) of the Vratnica tumulus, highlighting three vertical anomaly zones located in the lower half of the profile, between approximately 840 ns and 1200 ns.

These anomalies-marked as A, B, and C-display vertically oriented, high-intensity reflection patterns suggesting the presence of subsurface features with significant material contrast. Anomaly A appears as a compact vertical cluster, Anomaly B is a prominent and denser vertical column possibly indicating a constructed or engineered element, and Anomaly C comprises multiple concentrated linear returns, potentially corresponding to upright or organized features. These patterns are consistent with previous interpretations of the tumulus as a structured or layered formation, meriting further multidisciplinary investigation.

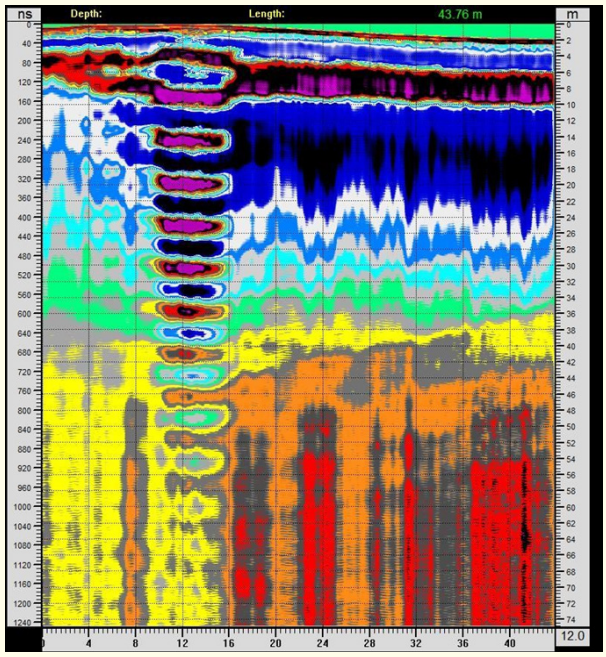

Figure 13: Ground Penetrating Radar (GPR) scan (43.76 m profile length) of the Vratnica tumulus, revealing a strikingly regular sequence of vertically aligned, elliptical high-reflection anomalies between approximately 80 ns and 860 ns, concentrated along the 12-meter horizontal axis. These anomalies exhibit rhythmic spacing and layered continuity from shallow (approx. 3- 4 m) to deeper subsurface levels (10+ m), forming a pillar-like pattern. This consistent vertical feature aligns with the location where a continuous 28 kHz electromagnetic beam was detected and measured on top of the tumulus (see Figure 7). The correlation between this structured vertical anomaly and the measured energy emission suggests a possible engineered conduit or chamber designed to facilitate or focus energy transmission. The anomaly's characteristics significantly exceed those expected of natural geological formations, supporting hypotheses of advanced subsurface architecture.

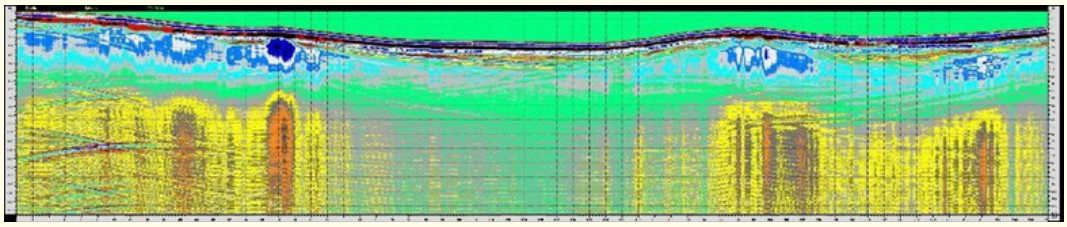

Figure 14: Ground Penetrating Radar (GPR) scan of the Vratnica tumulus, conducted with a 50 MHz antenna across a 251.94 m profile. This long-range section reveals multiple deep- penetrating anomalies of high reflectivity, many of which display a vertical, column-like morphology consistent with structural features. Notable anomalies appear at approximately 64- 74 meters, 176-188 meters, and 232-240 meters along the horizontal axis, characterized by tightly packed alternating reflectors. These vertical bands extend from mid to deeper depths (~14-28 m), potentially indicating regularly spaced subsurface features such as shafts, walls, or chamber interfaces. Shallow high-reflective zones and large dark blue void-like signatures suggest the presence of layered cavities or engineered spaces. The regularity, intensity, and distribution of the anomalies support the hypothesis of complex internal architecture consistent with artificial construction.

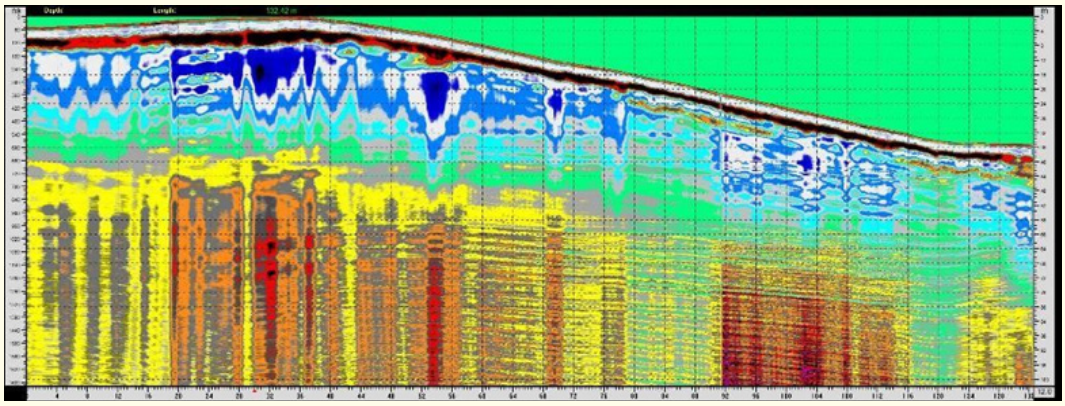

Figure 15: Ground Penetrating Radar (GPR) scan using a 100 MHz antenna, covering a 132.42 m horizontal section of the Vratnica tumulus. This profile reveals a concentration of vertical high-reflectivity anomalies between 20-36 meters and again from 92-108 meters, extending from approximately 12 to 32 meters in depth. These anomalies present as vertically elongated zones with sharply defined boundaries, possibly indicating the presence of subsurface pillars, shafts, or other engineered elements. The repetitive linear features and their organized vertical spacing suggest non-natural structuring. Additionally, a dense clustering of deep horizontal reflectors beneath these vertical forms may indicate chamber flooring or a basal layer of construction. This scan further supports the presence of complex, multilayered internal geometry within the tumulus structure.

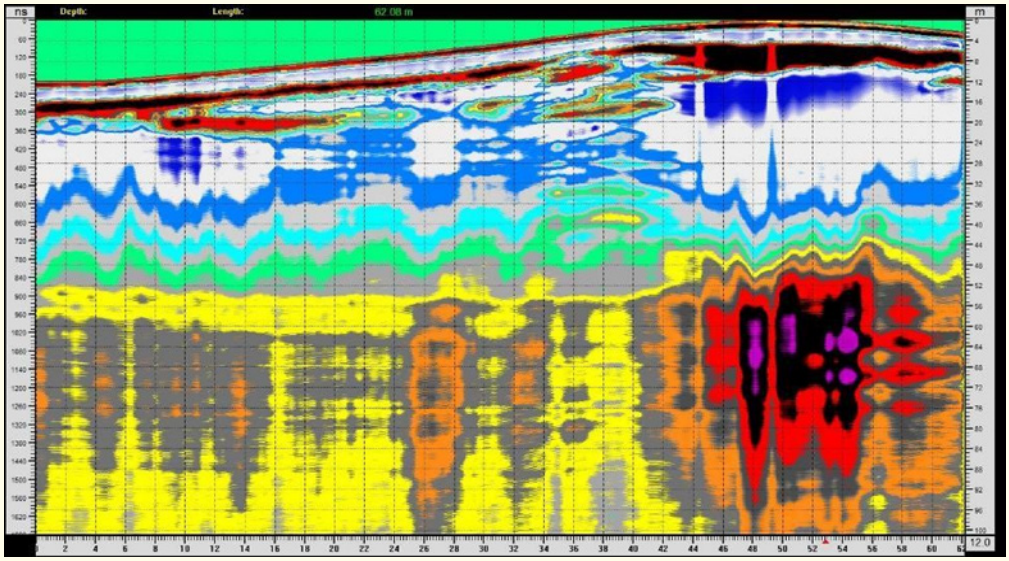

Figure 16: Ground Penetrating Radar (GPR) scan using a 100 MHz antenna over a 62.08 m section of the Vratnica tumulus. The near-surface zone (0-2 m depth) displays a highly uniform and continuous stratigraphy, characterized by horizontally aligned high-amplitude reflections in red and black, suggesting a manually compacted or constructed surface layer- possibly a form of engineered capping or protective layer. This regularity sharply contrasts with the underlying stratigraphy.

In the mid-depth region (10-50 m), the scan reveals typical geological layering with moderate heterogeneity and some discontinuities, likely due to natural sedimentation or structural changes over time.

In the lower right quadrant (approx. 46-60 m horizontal and 60-76 m depth), a pronounced anomaly is evident-marked by dense, high-reflectivity red and purple zones. This formation exhibits defined geometric boundaries, internal layering, and isolation from the surrounding matrix, which may indicate a buried chamber, cavity, or artificial structure. The intensity and coherence of this feature support its classification as non-natural. Transitional horizontal reflections above the anomaly suggest structural compartments or infill layers.

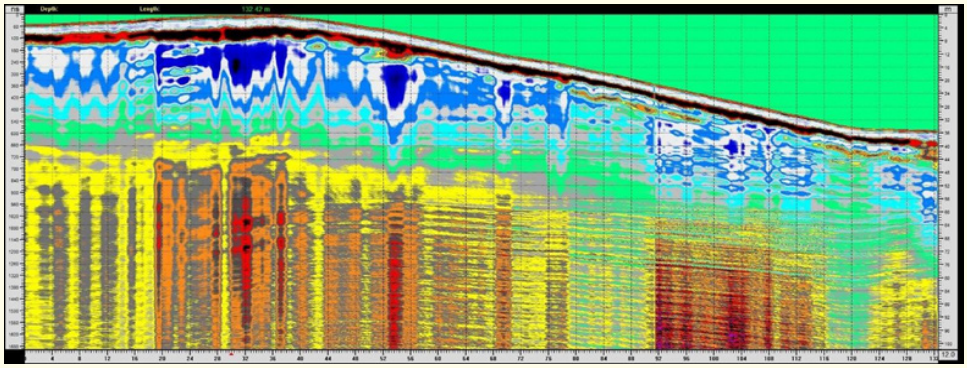

Figure 17: GPR scan (50 MHz) showing a vertically aligned series of high-reflection zones (yellow, orange, and red) extending from approximately 9 meters to over 27 meters in depth, concentrated around the 20-32 meter horizontal mark. These stacked cylindrical anomalies exhibit consistent geometry and signal intensity, which may correspond to architectural or energetic structuring elements aligned with the central axis of the tumulus. This geometry aligns spatially with the location of the 28 kHz energy beam detected at the apex (Figure 7), reinforcing the hypothesis of a functional central core or "resonant column" within the structure.

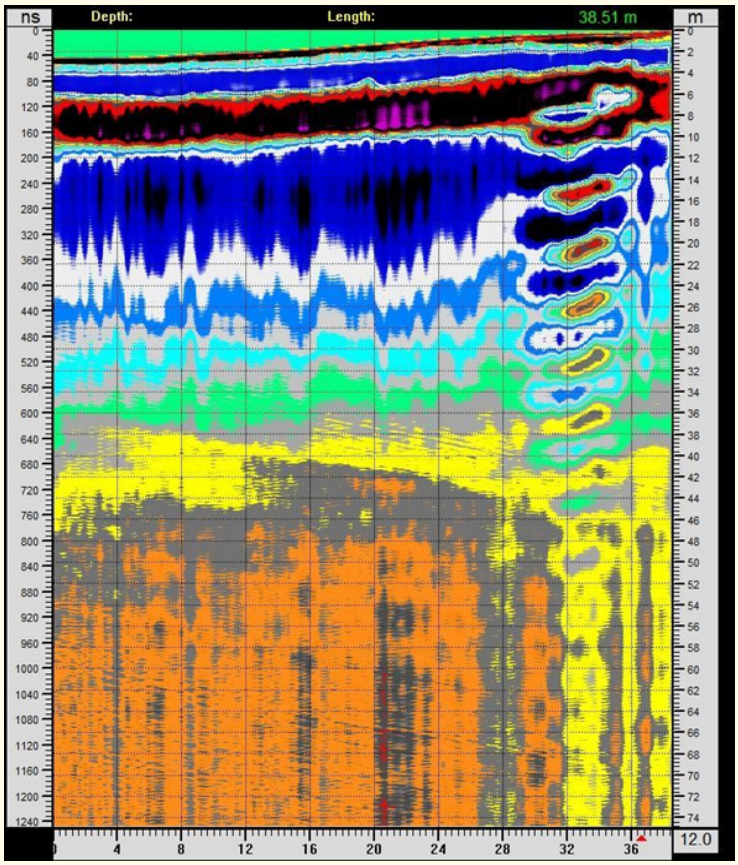

Figure 18: GPR scan (50 MHz) covering 38.51 meters of linear profile, revealing a dense sequence of horizontally stacked elliptical anomalies on the right-hand side, ranging from 6 to 32 meters in depth. These high-reflectivity zones (marked by red and orange bands within blue stratigraphy) display notable symmetry and consistent spacing, suggesting potential chamber-like cavities or purposefully segmented internal zones. Their alignment and structural coherence may support the hypothesis of non-natural, engineered subsurface architecture within the upper northeastern slope of the Vratnica tumulus.

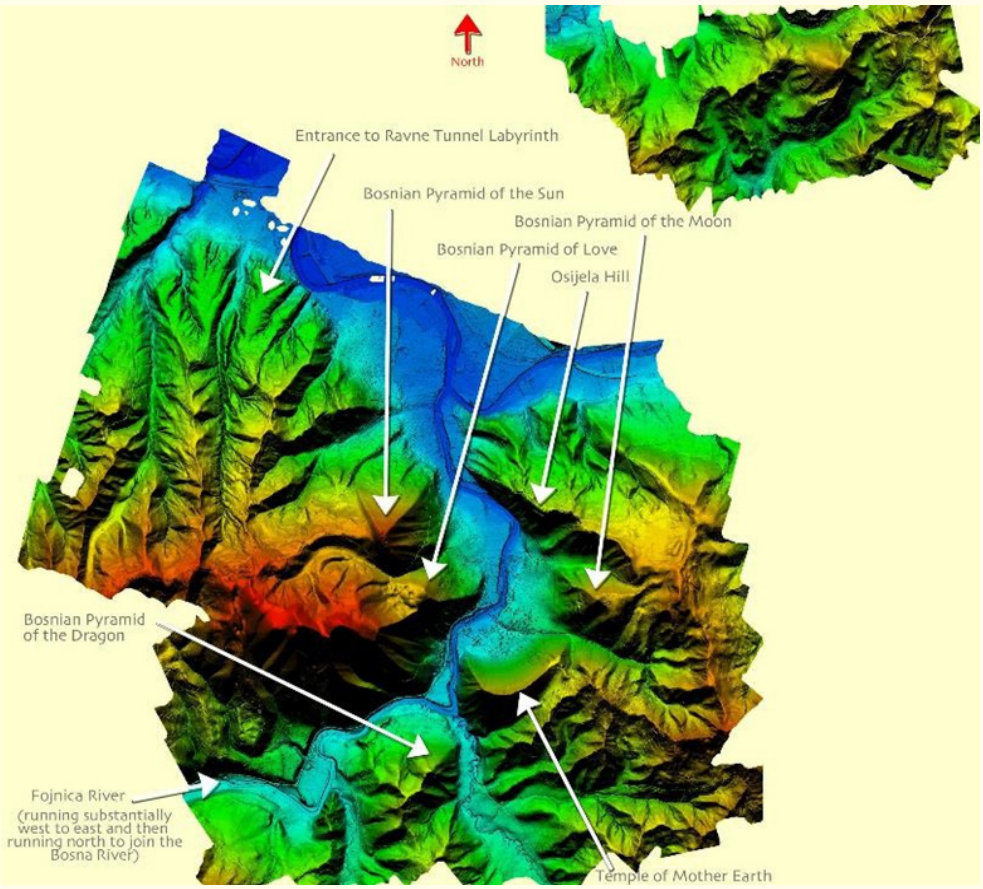

Figure 19: LiDAR-generated Digital Terrain Model (DTM) of the Bosnian Valley of the Pyramids reveals topographical precision and structural geometry among major features, including the Bosnian Pyramid of the Sun, Pyramid of the Moon, Pyramid of Love, Pyramid of the Dragon, and Temple of Mother Earth. The LiDAR data were acquired by Airborne Technologies GmbH, an Austrian geospatial service company, under Contract 14/15 between 2015-2022. The survey was conducted using a RIEGL LMS-Q680i airborne laser scanner, capable of capturing up to 400,000 measurements per second at a wavelength of 1550 nm. The high point cloud density (15-20 points/m^2) enabled vegetation filtering and the production of accurate terrain models, further supporting structural analysis and spatial alignment studies. This model corroborates geometric relationships previously discussed in Osmanagich, S., Acta Scientific: Environmental Sciences, 2.1. (2025) 16

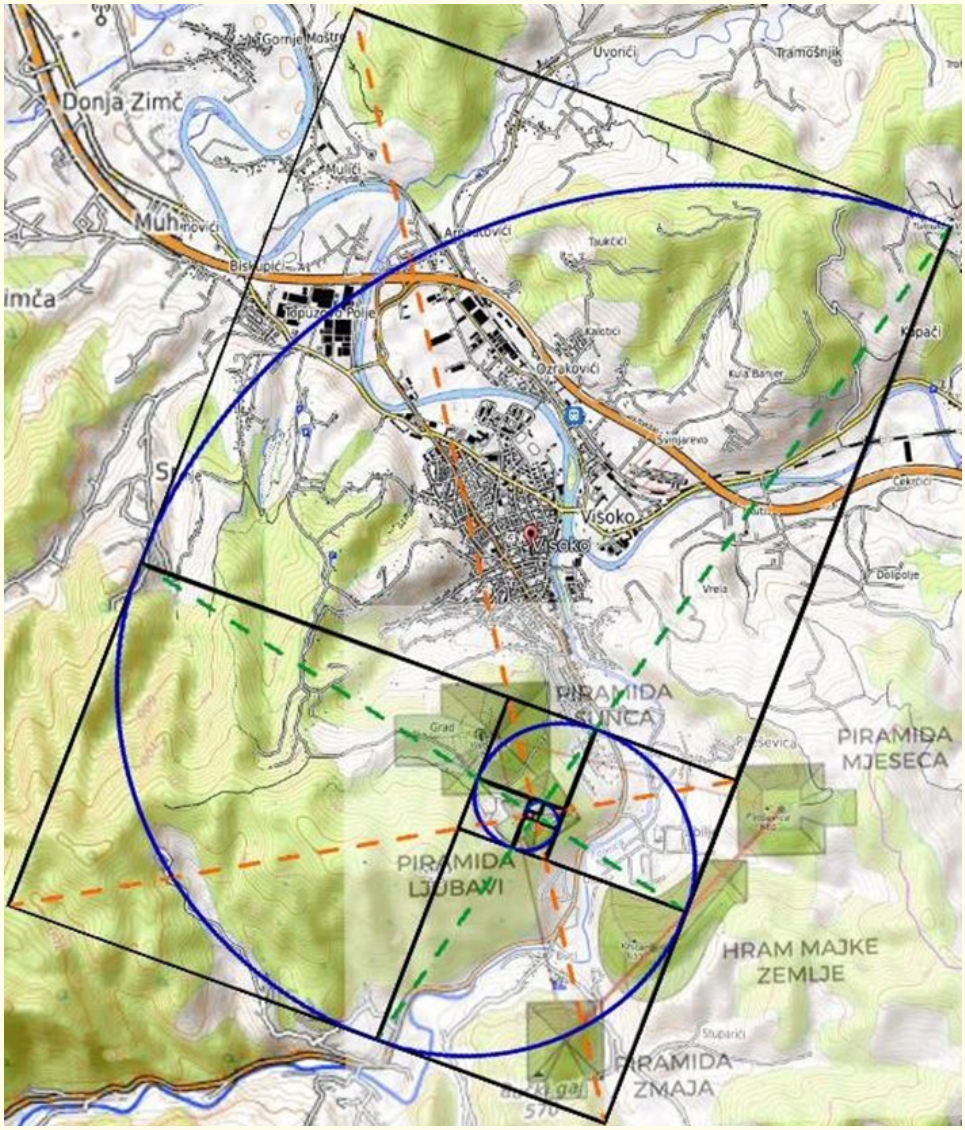

Figure 20: Based on high-precision LiDAR scanning conducted by Airborne Technologies GmbH (Contract 14/15), this map reveals a remarkable geometric layout in the Bosnian Valley of the Pyramids. The visualization shows a Fibonacci spiral (Golden Section) overlaid across key pyramid structures, with the top of the Vratnica Tumulus positioned precisely at the end of the spiral arm. The layout includes concentric circles and golden rectangles, suggesting intentional spatial relationships, advanced geometry, and possibly astronomical or energetic considerations embedded in the valley's design.

Source: Korotkov, K., Osmanagich, S., Pyramids: The Influence of Form on Environment, Part II: Bosnian Pyramids, Acta Scientific Medical Sciences, 8.11. (2024), p.3

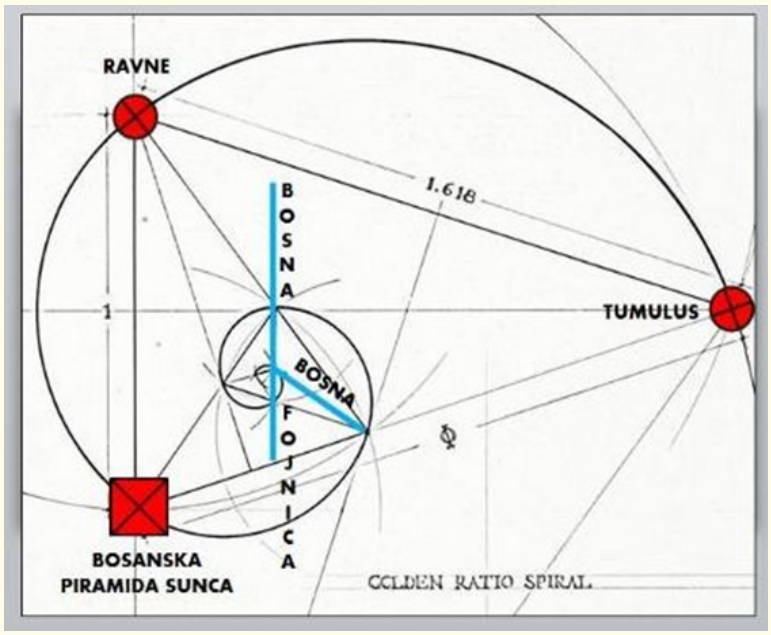

Figure 21: Geometric and spatial analysis of the Bosnian Pyramid of the Sun, Ravne Tunnel entrance, and the Vratnica Tumulus reveals a remarkable application of sacred geometry. The layout forms an isosceles triangle, with the two equal sides extending from the Pyramid of the Sun to Ravne Tunnel and from the Pyramid of the Sun to the Vratnica Tumulus. Most strikingly, the ratio between the longer and shorter sides of this triangle approximates the Golden Ratio (1:1.618), a proportion revered across ancient cultures for its aesthetic and energetic significance.

The configuration incorporates a Golden Ratio spiral, emanating from the Ravne Tunnel complex and expanding outward through the pyramid structures, with its terminal point precisely landing on the apex of the Tumulus. This spiral isn't just symbolic-it echoes natural growth patterns found in shells, galaxies, and botanical formations, suggesting a deliberate bio-energetic or cosmological design.

Additionally, the triangle's base, stretching between Ravne Tunnel and the Vratnica Tumulus, aligns with the Bosna and Fojnica Rivers, which act as both natural boundaries and energetic channels. The combination of mathematical symmetry, natural geography, and archaeological features reinforces the hypothesis of an intentional master plan guided by ancient principles of harmony, energy flow, and spatial resonance.

Source: Osmanagich, S., Acta Scientific: Environmental Science, 2.1. (2025) 19.

The most prominent radar signature is a linear, dense anomaly extending across the central body of the tumulus, located approximately 54 meters below the surface. This feature corresponds to the core-drilled artificial block, composed of calcium-potassium geopolymer cement (Figure 22). Below this layer, GPR imagery has identified a consistent void estimated to be approximately 4 meters in height, reinforcing the interpretation of an engineered chamber or airspace.

Additional GPR profiles show vertically stacked anomalies and dome-like cavities with symmetrical margins, possibly indicating intentional hollow zones or acoustic chambers. These profiles are reinforced by data collected using 25 MHz and 50 MHz antennas, with deeper scans displaying clearer structural boundaries. The geometric regularity of these features-such as parallel alignments, rectangular formations, and intersecting axes-adds further weight to the hypothesis of human modification or construction.

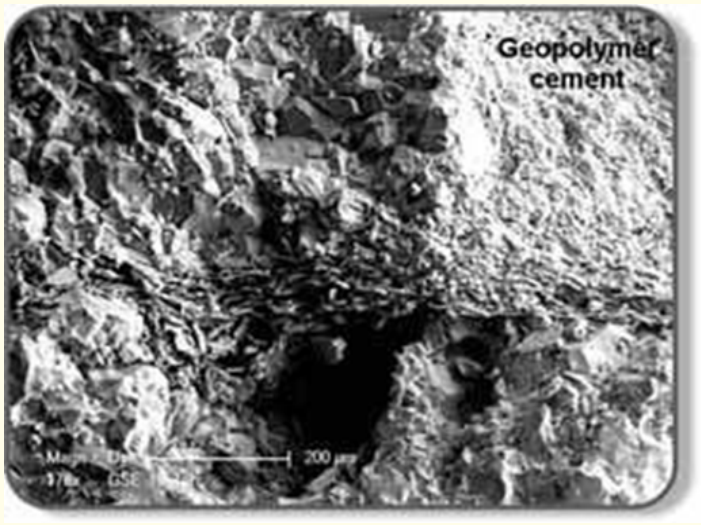

Figure 22: Petrographic and structural confirmation of artificial construction within the *Vratnica Tumulus*, supported by GPR analysis. Electron microscope imagery of a core-drilled sample extracted from 54 meters depth in the central body of the Vratnica Tumulus revealed an engineered material containing calcium/potassium-based geopolymer cement. Laboratory analysis conducted by the French Institute for Geopolymers (Davidovits, 2008) identified the sample as man-made ancient concrete, similar to geopolymeric blocks found on the Bosnian Pyramid of the Moon.

The drill sample, 2 meters thick, was seated above a 4-meter cavity, which had previously been detected via GPR scanning (see Figure 11). The corresponding radar profile revealed a high- density, sharply bounded anomaly at this depth, with a signal drop-off directly beneath- interpreted as a potential hollow space or chamber. This multi-method correlation between geophysical evidence and material science strongly supports the interpretation of deliberate construction deep within the tumulus.

Source: Davidovits, J. (2008). Lab analysis results submitted to Archaeological Park Foundation. Documentation retrieved from: *Osmanagich, S.* Pyramids around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, 2014 242; Geological probe by Geoprojekt Tuzla and Dr. Izet Kubat, 2008.

Moreover, electromagnetic testing conducted on-site detected a persistent 28.4 kHz frequency beam at the apex of the tumulus. The beam appears narrowly focused, with a measured diameter of approximately 4 meters. The frequency, previously detected on other pyramidal structures in the Visoko complex, is not typical of surrounding infrastructure or natural emissions. This finding raises the possibility of an energetic function embedded in the structure's geometry or materials. (Figure 7).

In combination, these geophysical data sets provide a compelling picture of subsurface organization and potential technological design. The evidence supports a working hypothesis that the tumulus contains intentionally constructed cavities, blocks, and conductive materials forming part of a broader, possibly energetic or communicative system.

Energetic

Energetic studies conducted on the Vratnica Tumulus reveal a recurring pattern of electromagnetic emissions that appear to be both stable and anomalous. Initial tests by teams of engineers and physicists using calibrated instruments such as Gaussmeters (EMF 823 and EMF 828), oscilloscopes, and broadband spectrum analyzers documented a focused signal of 28.4 kHz emitted vertically from the apex of the tumulus. This frequency is not associated with known natural sources or regional infrastructure.

Further tests revealed the stable presence of the 7.83 Hz Schumann resonance at the site. This Earth-native frequency is commonly associated with biological and mental equilibrium. When tested near technical radiation sources, the Schumann signal distorted or disappeared, but it remained stable and clear on the tumulus. This suggests that the structure may play a role in preserving or amplifying naturally beneficial frequencies (Figure 23).

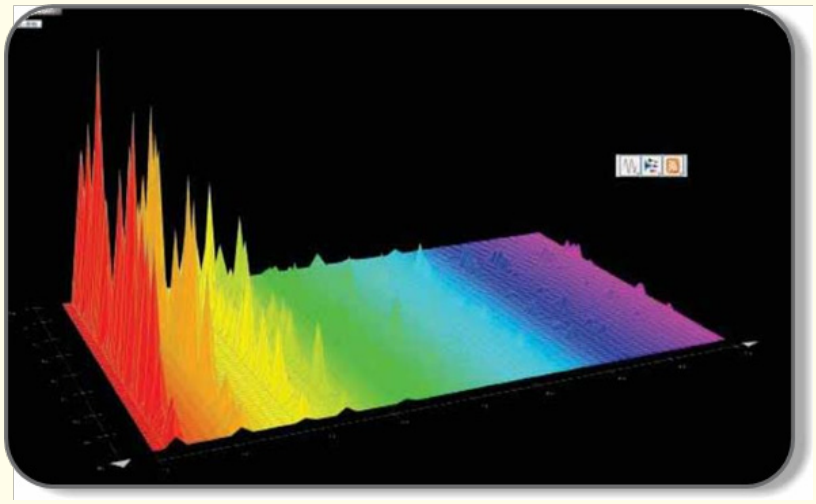

Figure 23: Measured Schumann resonance and electromagnetic frequency spectrum on the Vratnica Tumulus.

This graph captures the detection of the Schumann resonance (7.83 Hz) at the apex of the Vratnica Tumulus, recorded during electromagnetic field testing conducted in April 2013 by engineer Goran Samoukovic. The resonance was measured under natural conditions, demonstrating a strong and stable signal. However, when approaching areas of technical radiation, the 7.83 Hz frequency became unstable or displaced-highlighting the influence of human-made electromagnetic interference and the tumulus' potential as a natural energy stabilizer.

In addition to the Schumann resonance, other measured frequencies included

- 28.4 kHz: A persistent, narrowband signal also recorded on the Bosnian Pyramid of the Sun, possibly representing a directed or focused energy beam.
- 50 Hz: The frequency of conventional power grids, typically associated with technical radiation and long-term physiological stress.
- ELF/ULF range (1-20 Hz): Low-frequency emissions of uncertain origin, some of which appeared modulated or harmonic.

These results align with previous research into electromagnetic anomalies in the Bosnian Valley of the Pyramids and contribute to the growing evidence of intentional energetic design or naturally resonant geological structuring within the complex.

Source: Samoukovic, G. (2013). Field report submitted to the Archaeological Park Foundation, April 2013., Osmanagich, S. (2014). Pyramids Around the World and Lost Pyramids of Bosnia, Archaeological Park BPS Foundation, pp. 320, 324.

These consistent and reproducible energetic measurements add to the growing body of evidence that the Vratnica Tumulus was designed with an understanding of electromagnetic and vibrational phenomena. Its capacity to transmit, focus, or modulate energy positions it not just as a symbolic structure, but as a potential tool or node in a wider energetic system.

Spatial geometry and alignment analysis

The spatial orientation of the Vratnica Tumulus suggests deliberate placement within a broader geometric context that includes other major features of the Visoko region. High-resolution LiDAR data and geodetic mapping have revealed alignments and ratios consistent with the golden ratio (1.618), as well as concentric spa-

tial relationships that appear too precise to be the result of natural formation alone. (Figure 19).

One of the most compelling geometric findings is the construction of a golden ratio spiral that intersects major archaeological features in the region-including the Bosnian Pyramid of the Sun, Ravne Tunnel complex, Pyramid of Love, and Pyramid of the Moon-terminating at the summit of the Vratnica Tumulus. The spiral's alignment, verified through overlaying on LiDAR terrain models, implies that the tumulus represents the outermost node of a carefully planned spatial design. The accuracy of the spiral's conformity to known golden ratio proportions suggests intentional geodetic planning using advanced surveying techniques (Figure 20).

Furthermore, the spatial relationships among these structures form geometric constructs such as isosceles triangles and rectangles whose side lengths are proportionally consistent with the golden ratio. The Vratnica Tumulus, the Pyramid of the Sun, and the entrance to the Ravne Tunnel complex together define an isosceles triangle with golden ratio proportions between its base and legs. These relationships may reflect a symbolic, energetic, or functional logic underpinning the region's design. (Figure 21).

These configurations have been observed in other ancient monumental landscapes, but the level of spatial integration in the Bosnian Valley-particularly the termination of the golden spiral at the Vratnica summit-provides strong evidence of intentional placement. Such geometric harmony would likely have required knowledge of trigonometry, land measurement, and possibly astronomy.

Taken together, the data support the hypothesis that the Vratnica Tumulus is not an isolated feature but rather an integral part of a wider system characterized by sophisticated spatial logic.

Comparative and interpretive context

To better understand the Vratnica Tumulus within a global context, it is essential to compare its features to similar monumental structures worldwide. Across cultures and time periods, tumuli and conical mounds have served diverse roles-ranging from funerary monuments to astronomical markers, ceremonial platforms, and potential resonant or energetic structures.

The physical and geometric properties of the Vratnica Tumulus closely parallel certain large- scale constructs such as Silbury Hill in England, Herodium in Israel, and Mount Nemrut in Turkey. All three exhibit deliberate construction on elevated terrain, internal voids or chambers, and an absence of typical burial artifacts despite their presumed funerary functions. The apparent symbolic and architectural complexity of these structures suggests they may have served more than a singular purpose.

In Vratnica, a combination of megalithic construction, core-drilled artificial material, precise spatial alignment, and energetic emissions point toward a multidimensional interpretation. Such a perspective challenges conventional archaeological models, especially those that limit prehistoric or protohistoric societies to rudimentary engineering or symbolic output. The coordinated integration of form, function, and environmental resonance in the tumulus suggests knowledge systems that may have included geomancy, astronomy, or subtle energy manipulation.

If the energetic and geometric phenomena observed in Vratnica are indeed intentional, it may indicate that this and similar structures were conceived as components of a broader infrastructure-a network designed not merely to memorialize the dead but to interact with the Earth's natural fields, the cosmos, or human consciousness itself. This interpretive framework invites further interdisciplinary research involving archaeology, geophysics, architecture, and other sciences.

Discussion

The multidisciplinary findings presented throughout this study suggest that the Vratnica Tumulus is more than a conventional prehistoric burial mound. The convergence of geomorphological anomalies, megalithic construction, artificial material composition, electromagnetic emissions, and precise spatial geometry points to a complex, intentional design that challenges prevailing archaeological interpretations. The possibility that this structure was engineered to interact with natural energies-such as the Schumann resonance and a 28.4 kHz frequency-expands its potential functional framework beyond mortuary or symbolic significance.

Rather than interpreting such phenomena as isolated anomalies or results of later disturbances, this study encourages the integration of emerging data from geophysics, archaeoacoustics, and spatial mathematics into the archaeological discourse. Comparative examples from other tumuli such as Silbury Hill, Herodium, and Mount Nemrut underscore the global pattern of enigmatic mounded structures that defy singular classification. These parallels support the view that some ancient societies possessed knowledge and intent that included energetic, astronomical, and geometric dimensions.

The Vratnica Tumulus thus represents not only an archaeological site of regional importance but a potential keystone in the re-evaluation of ancient engineering and its broader purposes. Its role within the topography of the Bosnian Valley, its electromagnetic behavior, and its material construction may reflect principles and intentions not yet fully recognized by conventional archaeology.

Conclusion

The Vratnica Tumulus exhibits a constellation of features-structural, energetic, and geometric-that suggest it was conceived and constructed with a level of sophistication exceeding typical prehistoric burial mounds. The integration of artificial construction materials, engineered voids, consistent energetic emissions, and adherence to spatial patterns such as the golden ratio supports a working hypothesis of intelligent design.

While definitive interpretations will require further interdisciplinary investigation, the evidence compiled in this study justifies a shift in perspective. The Vratnica Tumulus, along with similar enigmatic structures globally, may represent an ancient paradigm in which landscape, energy, and consciousness were interwoven. This hypothesis warrants continued research with expanded geophysical, acoustic, and material testing to further evaluate the true nature and potential function of the tumulus.

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Conflict of Interests

The author declares no conflict of interest related to the research presented in this article.

Author Contributions

The author conceptualized the study, directed fieldwork, interpreted multidisciplinary data, and wrote the manuscript. Permissions and research oversight were coordinated through official institutions of the Zenica-Doboj Canton.

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