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Remote sensing methodology for estimating solar potential in historic buildings- case study in Gradsko, Macedonia

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ABSTRACT:

The proposed research examines the possibility of estimating solar potential in historic buildings. For the purpose of the research, the case study is the city of Gradsko in Macedonia. This study estimates the solar potential of roof surfaces by applying LiDAR technology and a remote sensing approach to three relevant historic buildings in Gradsko: the library, municipality, and school and culture center. The study intends to support environmental efforts through applying the energy potential of these buildings through the mapping of building roofs and the analysis of solar capacity. The data show that roof direction and geometry play an important influence in determining solar efficiency. The orientation of the analyzed buildings has connection to the solar potential, emphasizing strategic design and planning in optimizing energy gains. The study demonstrates that incorporating solar infrastructure systems in historic buildings result with high degree of energy independence. Therefore, the proposed study confirms the possibility of applying solar energy in historic buildings by efficiently processing large datasets using digital tools. That contributes towards incorporating the results to broader regional and national energy transition strategies. The findings underscore the significance of expanding solar mapping methodology in order maximizing renewable energy production and emphasize sustainability in the built environment.