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**Florina CHITEA, Dumitru IOANE,
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DENSITY MAPS FROM GRAVITY INVERSION AS A TOOL FOR THE BASIN BASEMENT ANALYSIS AND IMAGING

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ABSTRACT

Previously devised method for density mapping of the Cenozoic basin's basement is further developed in order to improve the visualization and geological interpretation of the results. The method combines gravity-density inversion with forward modeling and requires gravity anomaly and depth-to-basement data. Although it was primarily designed for application in well-researched basins, such as Pannonian basin, method does not require further constrains. An information on density distribution in the Cenozoic sediments (from density logging or core density measurements) is important for the quality of inversion results, since it is necessary to extract the gravity effect of the basement from the total anomaly. Several previously conducted tests of the method applied on synthetic models have indicated that potential errors could occur in the case of abrupt changes of the basement depth. That problem becomes emphasized as the depth-to-basement decreases. Therefore, the method was further tested for the effects of shallow and/or rugged basement topography in different areas of Pannonian basin in Vojvodina, Serbia. The outcome of the linear inversion is lateral density distribution in the basement buried under the sedimentary basin, presented as a map or a profile. Density maps and profiles are the base for the geological interpretation, including the spatial distribution of different rock formations that constitute the basement. Semi-automatic procedures, similar to those used in the potential field data analysis, are used to define boundaries between the formations of different density in the horizontal plane. An attempt to define boundaries in the vertical plain using basement topography is also presented. All images obtained through the analysis are merged in the final geological interpretation. Research area in the northwestern Vojvodina was chosen for the complex and relatively shallow basement topography. The results of gravity inversion were first compared and then combined with all available data on age and lithology of the basin basement, as well as to sparse density data from the boreholes.