



Gravity interpolation in mountainous areas

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The paper presents a comparison among different techniques in interpolating gravity anomalies in mountainous areas. A gap of $1^{\circ} \times 1^{\circ}$ has been artificially created within the free-air gravity anomalies data set for Austria. The remaining data set has been used to interpolate the free-air gravity anomalies at the gap points; then a comparison between the interpolated and the data values has been implemented to determine the accuracy of the used interpolation technique. Different interpolation techniques have been tested. Kriging interpolation technique from free-air gravity anomalies has been implemented. Traditional remove-restore technique has also been used. The window technique, suggested by Abd-Elmotaal and Kühtreiber (2003) to get rid of the double consideration of the topographic-isostatic masses within the data window in the framework of the remove-restore technique, has also been tested. For the latter two techniques, the reduced anomalies have been used to interpolate gravity anomalies at the data points of the gap using a least squares collocation technique. The effect of the topographic-isostatic masses has been restored using the both techniques. A comparison between the data and interpolated values of free-air anomalies at the gap points has been carried out. The results show that the Kriging technique cannot be used for gravity interpolation in mountainous areas and the window technique gives the best results. The range difference and the standard deviation of the residuals in case of the window technique are smaller than those of the traditional remove-restore technique by about 25%.