



Estimation of the Eötvös components using local gravity measurements

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The elements of the Eötvös matrix are useful for various geodetic applications, such as interpolation of the elements of the deflection of the vertical, determination of gravity anomalies and determination of geoid heights. A torsion balance instrument is customarily used for the determination of the Eötvös components. In this work, we show that it is possible to estimate the Eötvös components at a point on the Earth's physical surface using gravity measurements at four nearby points, comprising a very small network. In the first part we present the method in detail, while in the second part we demonstrate a numerical example. We conclude that this method is able to estimate the elements of the Eötvös matrix with satisfactory accuracy.