

SURFACE FITTING METHODS – EXAMINATION ON A SYNTHETIC AND A FIELD MAGNETIC DATASET

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Creating map from a spatially distributed point-like dataset is an important part of geophysical data processing. There are a number of statistical and numerical methods for this job, but the applicability of them are heterogeneous. Some of them are fast but less precise, and others give better results, but the running time of the algorithm is longer. There are two major categories of these methods: the smoothing and the exact interpolators. The correctness of the surface model interpolated from a data set is examineable in many points of view. The residual of a grid has calculated for characterize the reliability of a method. A residual is the difference between the Z value of a point in a data file and the interpolated Z value at the same XY location on a gridded surface. The size and the distribution of this values, can characterize the correctness of a method. The usefulness of some interpolation method depends on the geometry of the natural surface. Some of them give correct approximation for surfaces bent steadily, but product totally bad if there are edges, corners or break-lines. Two synthetic (a pyramid and a paraboloid) and a field dataset has used in this paper for examinations. The field dataset is a part of the Online Magnetic Dataset for North America, with more than 200,000 data points. In this paper the examinations are executed by Goldensoftware Surfer 8.01 (2002) mapping system. Some examples are presented for absolute abused interpolation, and the advantages and disadvantages of some method. The differences between various interpolation methods are presented. The examination technique of these methods is introduced as well.

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