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Optimisation of Global Grids for High-Resolution Remote Sensing Data

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Upcoming remote sensing systems onboard satellites will generate unprecedented volumes of spatial data, hence challenging processing facilities in terms of storage and processing capacities. Thus, an efficient handling of remote sensing data is of vital importance, demanding a well-suited definition of spatial grids for the data's storage and manipulation. For high-resolution image data, regular grids defined by map projections have been identified as practicable, cognisant of there drawbacks due to geometric distortions. In this regard, we defined a new metric named grid oversampling factor *GOF* that estimates local data oversampling appearing during projection of generic satellite images to a regular raster grid. We computed *GOF*-values for common map projections, optimised their parameters and excluded the possibility of undersampling. The results concluded that equidistant projections are most suitable, showing a global mean oversampling of 3% when using six continental grids. Opposed to previous studies that suggested equal-area projections, we recommend the Plate Carrée, the Equidistant Conic and the Equidistant Azimuthal projection for global, hemispherical and continental grids, respectively.