

## Visualization of Distortions in Cylindrical Projections

Miljenko Lapaine, Dražen Tutić

University of Zagreb, Faculty of Geodesy, Kačićeva 26, 10000 Zagreb, Croatia  
mlapaine@geof.hr, dtutic@geof.hr

**Abstract:** Representation of Earth's surface in a plane is distorted in any map projection regardless of it being a sphere or ellipsoid surface. Lengths, areas and angles are distorted. Distortion magnitudes are one of the most important indicators of map projections' quality.

Some projections preserve angles (conformal), some preserve areas (equal-area) and some preserve lengths in a direction (equidistant). Distribution of linear scales is going to be explained for normal aspect cylindrical projections. A linear scale as a function of rectangular coordinates is suitable for this purpose. This was not usual practice in common cartography textbooks, making derivations of corresponding formulas in the Gauss-Krüger or the transversal Mercator projection seem like something special compared to other projections. Nowadays, contemporary information technology enables simple production of graphs and their quick change according to given parameters. This is a dynamic approach to cartography, and this paper demonstrates an interactive approach and distortion distribution visualization.

**Keywords:** map projection, cylindrical projection, distortion of map projection, visualization