



## **Evolution of Earth gravity induced geographically dependent radial orbit error for satellite altimetry**

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Rosborough's theory (1986), amended by our newer works, describes Earth static gravity induced radial orbit error as a function of latitude and longitude. We outline here an evolution of the error for typical altimetry orbits from the old gravity field models till the recent ones. First we inform on prerequisites needed for an objective evaluation of the error. At the beginning of altimetry era the error was large, highly variable with both latitude and longitude, showing often clear along-track signature. The progress is from meters in the radial error (with calibrated covariance matrices) at about 1980 till individual centimeters for the most recent gravity models. Today, geographic features are weak, there is nearly no dependence on longitude even when the full covariance matrix is used for computations. Now we approached situation when the radial orbit error is not dominated by the gravity induced error, but the environmental errors became most important.