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Precise quasi-geoid map of Iran based on minimum-distance Molodensky telluroid mapping

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Using geopotential values at 7990 precise leveling benchmarks of Iran a telluroid map has been computed. Knowing the GPS coordinates of precise leveling benchmarks, the telluroid has been computed as the lattice of points where the gravity potential of reference gravity field of Somigliana-Pizzetti is equal to the actual gravity potential field of the Earth at the leveling points in a way that the distance between telluroid points and the points on the terrain are minimized. That is, we have followed exactly the definition of telluroid according to Molodensky and have used the minimum-distance mapping criterion of Ardalan et al. (Journal of Geodesy, 76: 127-138) for mapping the earth's surface onto the telluroid. The computed telluroidal heights are next attributed to the surface of the reference ellipsoid to derive a quasi-geoid map for Iran. The computed quasi-geoid is compared with most recent geoid map of Iran. The computed quasi-geoid is compared with most recent geoid map of Iran and an average difference of 19.10cm +/- 0.37cm at 7990 precise leveling benchmarks.