

# **Fitting Geoidal Undulation Using Quantum-Behaved Particle Swarm Optimization: A Case Study in Taiwan Area**

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**Abstract:** The local geoidal undulation model can be generated from GPS geodetic height, orthometric height and proper curve fitting surface model. In recent years, the particle swarm optimization (PSO) is used to solve the optimization problem, and can solve the surface equation efficiently. The quantum-behaved particle swarm optimization (QPSO) is improved from the original PSO. It is a global convergence guaranteed and less parameters algorithm compared with the original PSO. This study uses QPSO to find the best 2<sup>nd</sup> curve surface model to fit the geoidal undulation of Taiwan area and attempts to find the most appropriate partition fitting range.

Keyword: QPSO, Geoidal Undulation, GPS leveling