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A Multifractal Approximation for the Newtonian Potential of Small Solar System Bodies

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We represent an algorithm for multifractal approximation of the Newtonian potential of small Solar Systems Bodies. This algorithm is based on decomposition of Newtonian potential in low- and high-frequency components using spherical scaling and wavelet functions, which practically represent low- and high-frequency filters. The multifractal approximation of the Newtonian potential can be achieved in two stages, namely the decomposition of the potential into low- and high-dependent scaling and wavelet coefficients and its reconstruction by means of these coefficients. Like in standard spherical function approximations, in the multifractal approach, all information about the Newtonian potential is contained in the set of scaling and wavelet coefficients from which the potential can be reconstructed. We suggest that the algorithm of multifractal approximation has many advantages, the main advantage being that it is well suited for local in combination with global Newtonian potential approximations. We demonstrate this algorithm for the approximation of the Newtonian potential of Phobos and Deimos.

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