

A new C++ Poisson series processor

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Abstract

One of the main problems in celestial mechanics is the construction of the analytical and semi-analytical planetary theories. The main objects included within them are the so-called Poisson series. In this paper a new C++ class for managing these objects will be constructed. This class involves methods to evaluate arithmetic operations with Poisson series, methods to compute the value of the usual functions (sin, cos, log, sqrt, binom,...), and functional methods with these objects (development in Taylor series, inversion, derivation and integration, etc.). In order to apply this class, a Keplerian processor was developed to study the two-body problem. To evaluate the efficiency of the processor, a perturbed problem was developed to a first order and its solution was compared with the solution given by other methods.

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