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# KAM Theorem applied to the plane planetary problem

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## Abstract

In 1963, Arnold showed that some version of Kolmogorov's invariant torus theorem can be applied to the 3-body problem, assuming that 2 bodies (the planets) have masses much smaller than the other one (the Sun). We will recall Arnold's scheme of proof and show how to obtain explicit bounds for the masses of the planets. This goes through analyzing the complex singularities of Kepler's equation and of the Newtonian potential, the loss of width of analyticity of the Hamiltonian due to normalizing transformations and using a very precise version of Kolmogorov's theorem strong enough to deal with the degeneracies of the problem.

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