Fine structure in narrow planetary rings

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We address the occurrence of narrow planetary rings and some of their structural properties, in particular when the rings are sheparded. We consider the problem as Hamiltonian scattering of a large number of non-interacting massless point-like particles in a effective potential. Using the existence of stable motion in scattering regions in this setup, we describe a mechanism in phase space for the occurrence of narrow rings. We find eccentric narrow rings displaying sharp edges, variable width, appearance of of distinct ring components which are entangled [1] and arcs.

References

[1] Merlo, O and Benet L.,Strands and braids in narrow planetary rings:a scattering approach *Celestial Mech. Dyn Astr*, **97**(49-72), 2007.