COLLISIONAL STATISTICS IN DEBRIS DISKS: PRELIMINARY RESULTS AND COMPARISON WITH ANALYTICAL THEORY

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Introduction: Debris disks are common components of planetary systems, like the Main Belt Asteroids and Edgeworth-Kuiper belt in our Solar System. Even if representing the residual part of the mass of the systems, debris disks provides important information about their past history. One of the most important mechanism that shapes their observational properties are the mutual collisions among the bodies that make them up. Probabilities of impact, distribution of the impact velocities, distributions of the geometry of impact are fundamental parameters used in several studies and theoretical models. Nevertheless, the computation of such quantities relies on some dynamical assumptions not valid in all cases. The most appropriate model must be developed on a case-by-case basis. Here some preliminary results are shown, obtained using a recent and general method of computation of the statistics of impacts among orbiting bodies [1]. Such method allows to take into account the secular effect of the perturbing planets, even in cases that cannot be addressed with the classic methods used for Main Belt Asteroids. A comparison with analytic theories [2] is discussed, highlighting the new revealed features.

References:
[1] Dell'Oro A. (2017) *MNRAS*, **467**, 4817-4840.
[2] Mustill A.J. & Wyatt M.C. (2009) *MNRAS*, **399**, 1403-1414.