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Numerical simulations of collisions of disk galaxies: the formation of tidal tails and tidal dwarf galaxies I.S. MARINOVA, S.A. LAMB, UIUC, N.C. HEARN, Washington State U., J. VAN SCHELT, UIUC — Evidence suggests that galaxies are formed hierarchically; however, this picture may be complicated by the generation of dwarf galaxies from collisions involving disk galaxies. Observations of so-called ‘tidal dwarfs’ (eg. Duc & Mirabel,1998; Duc et al., 2000) indicate that they are associated with the tidal tails often formed in such collisions. It is of interest to investigate numerically under what conditions dwarf galaxies might be formed in galactic collisions. We have performed numerical studies of the formation of tidal features in colliding disk galaxies for several collision geometries and have explored the possible associations of these features with ‘tidal dwarfs.’ The simulations were performed using the N- body/SPH code of Hearn (2002, Ph.D Thesis, UIUC) with galaxy models that consist of a stellar disk and bulge, a gaseous disk, and a roughly spherical halo. We explore collisions that take place along directions parallel to a disk spin axis for several relative disk orientations, and run the simulations for periods that correspond to several Gyrs for real systems. Extensive tidal features are a common result of these collisions and, once formed, they persist to the end of our simulations. The tails often extend to very large distances beyond the galactic cores. However, the presence of long-term self-gravity in these features remains open to further investigation.

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