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Transient dust populations in Saturn's ring system

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Saturn's ring system is a dusty environment, which acts as a natural collision laboratory. After the collisions in the E ring, the larger ejecta will be eroded by the surrounding E ring dusts, and makes the power-law size distribution of ejecta change. The E ring dusts composed by collisional ejecta from different satellites are examined. In the main ring, the meteorite impacts will make the ejecta move more vertically to the ring plain. In another aspect, due to small sizes of ejecta and charging processes, the motion of dust particles are affected by radiation pressure and Lorentz force. Considering the Solar radiation, Saturnian B field, co-rotating E field, and the cross-tail E field, we follow the evolution of motion, surface charge, and size distribution of collisional ejecta in Saturnian main ring and E ring. These kinds of dust populations may be observed during the 4 years Cassini-Huygens mission.