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Simultaneous Binary Collisions for the Collinear Four-Body Problem. Preliminary report.

In this talk, we study the structure of solutions of simultaneous binary collision (SBC) in the collinear four-body problem with equal masses. We explore new developments in the regularization of SBC. A canonical transformation of Levi-Civita type is introduced to regularize the singularity of SBC. Given any initial condition leading to SBC, the collision solution is unique up to SBC. However, there are infinitely many ejection solutions corresponding to this collision solution under the transformed variables. (Received August 29, 2011)