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Reconnection studies under more realistic conditions MARIA ELENA INNOCENTI, SERGIO SERENO, GIOVANNI LAPENTA, GIAN LUCA DELZANNO, JERRY BRACKBILL, WEIGANG WAN — Reconnection is a fundamental process in plasmas in Nature and in the laboratory. Its complication arises both from the complex processes developing on large scales and involving daunting topological changes in the magnetic fields and from the plethora of microscopic processes underlying the large scale evolution. The research has typically been most successful when the problem is reduced in complexity both from the standpoint of the equilibria where reconnection is allowed to develop and for the range of processes present (as can be obtained simplifying the physics studied or the dimensionality of the problem). In our past work we have removed the second limitation introducing a fully kinetic implicit PIC approach that treats concurrently large scale processes and the whole range of microscopic physics at a fully kinetic level. The present work addresses the first issue. We present our most recent results where more realistic equilibria are studied including more realistic models of the relationship between the system and its surrounding with appropriate boundary conditions.

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