Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Solar flares and magnetic reconnection in quasi-separatrix layers G. AULANIER, P. DEMOULIN, M. JANVIER, S. MASSON, E. PARIAT, Observatoire de Paris, LESIA, Meudon, France — Magnetic reconnection is a fundamental plasma physics process which is believed to be responsible for the bulk of energy release in solar flares. One the one hand, the onset of fast reconnection in high-Reynolds plasmas has long since been regarded as, perhaps, the major issue to understand. On the other hand, little attention has relatively been given to the three-dimensional nature of this phenomenon. Up to very recently, the latter has mostly been addressed by the solar physics community, presumably due to the wealth of space-borne and ground-based observations of three-dimensional solar coronal features during flares. Among other 3D concept, finite-B "quasi-separatrix layers" (QSLs) have been introduced in the nineties, as a generalization of the concept of true separatrices emanating from null-points. In this talk, I will show how both solar and experimental physics have revealed that these QSLs physically behave like true separatrices, in terms of current sheet formation and magnetic reconnection, albeit for the continuous slippage of field lines during the process. I will then show how this "slip-running reconnection" occurs in the wake of flux-ropes erupting from the solar corona towrds the heliosphere, and how it it eventually forms the observed post-flare loops in the Sun's corona.

G. Aulanier
Observatoire de Paris, LESIA, Meudon, France

Date submitted: 03 Aug 2012 Electronic form version 1.4