magnetic reconnection onset from electron phase to ion phase

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It is still unresolved that how magnetic reconnection is triggered in the collisionless environment. In this talk, we will present that the reconnection onset consists of two phases: the electron phase and ion phase. In the electron phase, the electrons are significantly energized and super-alfvenic electron jets are created while the ion bulk flows haven’t been formed and the ions haven’t been heated. Later on, the ion jets are produced together with the electron jets in the ion phase. The main reason for such two phases is discussed. A particle-in-cell simulation was performed to realize these two phases during reconnection onset.