



Forced reconnection: The "Newton challenge"

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The onset of magnetic reconnection in the near magnetotail is one of the most crucial problems in understanding magnetospheric activity. It is now clear, from observations, theory and computer simulations, that the formation of a thin current sheet, or the thinning of the tail current sheet to a scale of less than the ion inertia length is necessary to cause fast reconnection. However, the way in which this thinning is achieved remains unclear. MHD theory and simulations support a view that external deformations of the magnetotail, imposed by the solar wind, can lead to the formation of a thin current sheet embedded in the near tail. In this presentation we explore the response of a thick current sheet to such external deformations, comparing MHD results with hybrid and PIC simulations. The study was designed in the context of a Workshop on Reconnection Theory held in August 2004 at the Isaac Newton Institute in Cambridge, England, using an approach akin to the "GEM reconnection challenge". The study includes investigations of the dynamics of reconnection as well as potential final states under the constraints of the imposed models.