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Dayside reconnection under extremely low solar wind density conditions

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This paper presents Cluster observation during a magnetopause crossing taken on February 14, 2004. Data are taken during a period of extremely low solar wind density (about 0.35/cm^3) when the solar wind is weakly super Alfvénic ($n_A \sim 1.8$). Due to these conditions, the magnetosphere is dilated, extending to about 16 Re in the solar direction. During this event, Cluster spacecrafts cross the magnetopause several times. During each of those crossings, high velocity ion beams ($>$500 km/s) are detected by the CIS instruments. Alfvénic accelerated flows, D shaped distributions and the presence of a reflected ion population indicates that theses beams result from the reconnection between magnetospheric and interplanetary magnetic field lines. We also use Cluster multi-point measurement to estimate the magnetopause motion and thickness during this event.