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Magnetic reconnection in a turbulent space plasma: Cluster multi-spacecraft observations in the magnetosheath

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In the turbulent Terrestrial magnetosheath downstream of the quasi-parallel bowshock thin current sheets are formed. Previous detailed studies of one of these sheets indicated that magnetic reconnection can occur within this turbulence. We present a first statistical study of reconnection in turbulent plasma. The electric and magnetic signatures are consistent with ongoing reconnection in several of the 70 investigated current sheets. The reconnection rate can be higher than for large-scale reconnection. The typical coherent dissipation (j dot E) associated with a reconnecting current sheet is estimated. The associated global dissipation rate may be inertial length scales.