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Dynamics of the Tail During Substorms: TCR and Current Disruptions

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We present a comparative study of Traveling Compression Regions and of Current Disruptions events as measured onboard Cluster and Double Star. TCR and CD have quite frequently been confused. Cluster data allow to make a clear distinction between these two phenomena in terms of spatial scale and duration, while simultaneous plasma and field data obtained onboard Cluster, Double Star and at geosynchronous orbit allow to infer the propagation characteristics of these events. We present detailed case studies of plasma and magnetic field changes associated with both TCR and CD and of the associated enhanced electric field/plasma convection in the lobes of the magnetotail. These multipoints measurements lead to a multi scale approach of the tail behavior and of the associated electromagnetic fields changes allowing inferring quantitative features of the dynamics of the tail in the course of substorms.