摘要： Since 1960s, plasma transport in the closed-field line region of Earth's magnetosphere was long thought to be dominated by large-scale sunward convection in the plasma sheet and gradient/curvature drift in the inner magnetosphere. It was thirty years later when scientists discovered a meso-scale transport process, called Bursty Bulk Flows (BBFs), which are now believed as key elements in plasma sheet transport, accounting for the majority of earthward transport of mass, energy, and flux. Studies of individual BBFs or bubbles and statistical analysis of their characteristic features have received much attention. However, their cumulative effects have not been quantitatively determined. In this presentation, I will show computer simulation results using the Rice Convection Model (RCM) to understand how the large-scale convection and the meso-scale injections interplay with each other. I will particularly focus on two questions: (1) what are the integrated effects of many localized bursty flows on average configuration of the plasma sheet and its coupling to the ionosphere? (2) to what extent do they contribute to the storm-time ring current energy? At the end of the presentation, I will also discuss further development of the RCM for better modeling of fast flows.