Recent results are presented from thin-filament MHD, Rice Convection Model Equilibrium (RCM-E), and global MHD simulations of the effects of local variations in the entropy parameter. All simulations of these effects have significant limitations. Thin-filament simulations neglect transport by gradient/curvature drift and apply only to highly idealized geometries. The RCM-E neglects inertial currents. Global MHD codes neglect transport by gradient/curvature drift and have numerical-accuracy problems. However, combining results obtained with different kinds of models allows us to gain insight into the physics. Thin-filament MHD simulations provide insight into Pi2 oscillations and also give information about the likely effect of the RCM-E's neglect of inertial effects. Based on RCM-E and global MHD simulations, we have developed a three-stage picture of the beginning of a substorm. In the first stage, imposition of a strong cross-tail potential in the RCM-E produces a minimum in field strength in the inner plasma sheet, accompanied by growth-phase-like stretched magnetic field and some current-sheet thinning. In the second stage, as represented by RCM-E simulations, assuming a violation of frozen-in-flux near the B-field minimum produces a region of high entropy (blob) tailward of a region of low entropy (bubble); Earthward motion of the bubble and tailward motion of the blob cause rapid thinning of the current sheet between them. In the third stage, which is represented in a global MHD simulation, continuation of the process described in stage 2 produces force imbalance, rapid acceleration, and eventually reconnection.