8 physical processes for the study of quantifying storm effects on IT system
(suggested by Tim Fuller-Rowell: NOAA SWPC and CIRES Univ. of Colorado)

Process 1: Quantifying the storm energy input

- Increase in magnetospheric/ionospheric high latitude convection and auroral precipitation
- Enhances conductivity at high latitudes and NO production
- High latitude winds accelerate by ion drag
- Joule heating increase
- NO cooling IR radiation measured by SABER (NO and T)
- Rate of temperature/density response and recovery

Process 2: Expansion of convection to low latitudes

- Penetration electric fields imposed at low latitude
- Recovery/shielding time-constants
- EIA response

Process 3: Build-up of plasma and structure at mid-latitudes

- Validate TEC from GPS maps
- Validate in-situ from satellite
- Validate point with ionosondes

Process 4: Gravity wave propagation from high to low latitude

- Validate arrival and magnitude of waves:
    - C/NOFS observations
    - Ground-based FPI
    - CHAMP density waves

Process 5: Onset/timing/evolution of global circulation

Process 6: Onset/timing/evolution of neutral composition change

- Response and recovery of O/N2 (e.g., TIMED/GUVI)
- Movement of boundaries in O/N2 (e.g., TIMED/GUVI)

Process 7: Ionospheric negative storm phase at mid latitude

- Validate TEC from GPS maps
- Validate in-situ from satellite
- Validation point with ionosondes

Process 8: Disturbance dynamo
