

# Evidence of highly-localized dispersionless particle injections inside GEO

- Four closely-located satellites at and inside geosynchronous orbit (GEO) provided a great opportunity to characterize the dynamical evolution and spatial scale of pre-midnight energetic particle injections inside GEO during a moderate substorm.
- The twin Van Allen Probes (RBSP) with only  $\sim 0.5 R_E$  apart in the east-west direction observed striking different injection signatures in the initial evolution: RBSP-B, located closest to the onset meridian, observed a dispersionless injection which occurred concurrently with a transient dipolarization front (DF), while RBSP-A, located slightly eastward from RBSP-B, observed a dispersed/weaker injection with no corresponding DF.
- The azimuthally-localized DF was accompanied by an impulsive, westward electric field.

The local presence or absence of deeply-penetrating DF fields can determine whether the concurrent injection inside GEO is a dispersionless or energy dispersed signature.

