

Evening electron flows from STARE multipulse velocities

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We study the differences between STARE line-of-sight velocities and EISCAT electron drifts along the STARE beams in four evening sector events having joint EISCAT/STARE observations (18 hours total time). We find that STARE Finland velocities are smaller than the corresponding EISCAT drifts by a factor of 1.5-2. This difference is somewhat larger than what has been reported earlier. For the Norwegian STARE radar, the trend is similar but the difference between STARE and EISCAT is smaller. In addition to the usual cosine law merging method we also applied the ion-acoustic approach (IAA). Especially when the total electron flow is slower than 800-1000 m/s, the IAA also yields underestimated velocities as compared to EISCAT. We also test the performance of a new approach (Uspensky et al., *Ann. Geophys.* 2003, in press). The new approach involves altitude integration over the whole E region and it needs EISCAT electron density height profile data, which is available for one of the events studied. For this event (Feb 12, 1999) we find that the new method produces results which are consistent with EISCAT. This suggests that the new approach is valid also for evening sector events (it has already been shown to be valid in the morning sector, Uspensky et al., 2003). Looking at other 3 evening events for which no information on the electron density was available we exhibit an efficiency of the new approach.