Comments on **"Tracking Traveling Ionospheric Disturbances through Doppler Shifted AM Radio Transmissions"** by Trop et al.

General Comments:

This study investigates Traveling Ionospheric Disturbances (TIDs), focusing particularly on nighttime TIDs, using a group of AM radio receivers and transmitters. Notably, the authors proposed an automated technique to track these disturbances, which serves as an effective tool for analyzing large datasets. Overall, the study's objective is intriguing, and the manuscript is well-written. However, several key points have not been addressed. For example, the authors used a radio frequency below 2 MHz, which can be significantly influenced by E region electron density. Yet, they did not present the E region conditions during the study period (April 2020 - March 2021). While it's understandable that nighttime data was selected to mitigate E region effects, nighttime sporadic E layers, which are common in this frequency range, pose substantial challenges for this study. Since AM radio waves reflect from the lower ionosphere, it would be beneficial to compare the results with OI630nm airglow imager data rather than rely solely on dTEC data (which could be used as a complementary source).Additionally, the seasonal characteristics of TIDs seem unusual. Typically, receivers located within a 200 km radius are more effective at identifying Medium-Scale TIDs (MSTIDs) than Large-Scale TIDs (LSTIDs) because MSTIDs cause greater density fluctuations over shorter distances, resulting in a higher electron density gradient. I recommend that the editor consider a major revision. Detailed comments follow:

Specific Comments:

1. It is crucial to provide information about the E region conditions during all events. For the thirteen events listed in Table 2, please check the Es layer conditions and compare the results with co-located airglow observations (based on availability).

2. In Table 3, many events show more than a 100 m/s phase velocity difference between the AM radio wave-detected TIDs and those observed via dTEC. The reasons for this discrepancy should be addressed more thoroughly by using the airglow observation as a complement.

3. As pointed out by Chilcote et al. (2015), the time window of the dTEC estimation method may not impact the phase velocity of TIDs. This can be verified by testing different time windows (such as 30 minutes or 1 hour).

4. Figure 8 is confusing. The title indicates the timeframe of April 2020 - March 2021, but the X-axis is labeled in days of the year starting from zero. Additionally, the titles for panels 8c, g, and j indicate events per month while the X-axis is in days; this inconsistency needs clarification.

5. As mentioned in the general comments, the results regarding seasonal variation appear strange, especially during summer and winter when MSTID activity is heightened over the U.S. sector. Please double-check these results against airglow imager or ionosonde observations.

Minor Comments:

- Line 33: Fritts and Alexander (2003) did not focus on gravity waves in the ionosphere/thermosphere.

- The papers by Cosgroves and Tsunoda (2000, 2006, etc.) are relevant and should be cited in line 34.

- According to line 81, sections 2 and 3 should be titled "Instrumentation" and "Methodology," respectively.

- Line 159 should include details on relevant local time.

- Line 167: Provide more detailed information about the semi-automated tracking method used in this study, including how manual corrections are conducted.

- Line 319: Correct “Narayan” to “Narayanan.”

- Please verify the geomagnetic conditions for all events listed in Tables 2 and 3.