Response to Reviewer 2

We would like to thank the reviewer for the detailed observations and constructive suggestions. We agree that some improvements necessary to make the findings stronger and we will follow the comments and suggestions of the referee to address highlighted points.

Comment 1: Figure 1 Images

We agree with the reviewer that the small inset images in the original Figure 1 do not provide sufficient detail to clearly identify the wave characteristics. As suggested, we will remove these tiny images from Figure 1. In the revised manuscript, we will include a new figure or additional panels featuring processed two-dimensional snapshots for each studied case. These snapshots will allow for a much clearer visual identification of the wavefronts and their morphological parameters.

Comment 2: Wind Profiles and Uncertainty

The objective of conducting simulations with two distinct wind profiles (one using the HWM14 model and another assuming zero background wind) is to perform plausible error estimation in the trajectory calculated by ray-tracing the waves. By comparing these two scenarios, we can evaluate how sensitive the wave trajectory is to the background wind field. In the revised text, we will clarify the logical background: when the trajectories between the two scenarios are similar (as observed in the 003 Santarém case), it indicates that the wave has a high phase speed, making it less susceptible to uncertainties in the wind model. This consistency reinforces the reliability of our estimated source locations.

Comment 3: Potential Errors in the Temperature Model (MSIS)

We agree with the referee that usage of NRLMSISE-00 empirical model introduces certain uncertainties, as it is a climatological model that may not capture localized and transient thermal variations induced by the solar eclipse. In the new Discussion Section, we will include a technical analysis of how potential discrepancies in the temperature profile affect the local speed of sound, thereby influencing refraction and the vertical propagation time of the wave packets. We will discuss that while MSIS is the standard tool in the absence of high-resolution satellite data for the specific event, it might underestimate the stratospheric cooling caused by the moon's shadow, leading to a small systematic error in the calculation of the origin altitude.

Comment 4: Origin Altitude (55–60 km vs. 42–50 km)

The choice of the 55–60 km range as the likely region of origin was based on prior studies, such as Schmidlin and Olsen (1984), which reported significant cooling (up to 10 K) at these altitudes during solar eclipses. However, the reviewer correctly points out that significant temperature drops also occur in the 42–50 km range. In the revised manuscript, we will expand our discussion to include this lower altitudinal range. We will analyze whether a source located at 45 km would still maintain spatio-temporal compatibility with the observed lunar shadow. If the trajectories still intercept the shadow at these lower altitudes within a reasonable time window, we will include this range as part of the uncertainty in determining the exact altitude of the source.