Review of the manuscript egusphere-2023-2264 "A multi-decadal time series of upper stratospheric temperature profiles from Odin-OSIRIS limb scattered spectra" by Zawada et al.

This article presents a study on the determination of the temperature of the upper stratosphere from observations of Rayleigh scattering at the limb of the Earth's atmosphere. There is little data on the temperature in this region, which is very sensitive to climate change, and the technique of measuring Rayleigh scattering at the limb is very promising as a complement to existing techniques based on observations of atmospheric radiance in the infrared or microwave spectrum. This article makes a valuable contribution to the subject with a careful analysis of performance and error budget using Odin-OSIRIS data. I recommend its publication on EGUsphere after a minor revision detailed below.

Section 2, lines 52-55: the downward measurements are taken at around 06:00 local time, also close to dawn or dusk. Could you explain why the geometric configuration is better for observations of the bright limb in the morning part of the orbit? Is it to do with the direction of pointing in relation to the plane of the orbit? This is probably linked to the solar zenith angle (SZA) at the tangent point. Information on the SZA as a function of latitude and season is lacking for a better understanding of the observation conditions.

Section 4.1
This section describes the absolute calibration effect. It is not clear to me why the absolute calibration correction has an impact on the recovered temperature. This is obtained using a comparison with SASKTRAN simulations used as a black box, but it would be interesting to know what the physical reason is. Is it related to the estimation of the multiple scattering contribution to the radiance?

Section 4.4, lines 275-279: Is it not possible to develop an algorithm to filter the radiance profiles contaminated by PMCs and keep the non-contaminated profiles in the database?

Section 5.3, Seasonal cycle: It is difficult to understand the seasonal evolution of temperature differences between satellites from Figure 11 showing the absolute temperature for each data set. It would be useful to show the seasonal cycle of these temperature differences directly.