Review of Karami et al., "On the climatological probability of the vertical propagation of stationary planetary waves"

The new version of the manuscript is clearer. With the additional references explaining where the expression for the refractive index comes from, it is easier to understand the paper. I think the "refractive index" used here needs to be explained more precisely, and more justification needs to be given for the authors' physical interpretation of it. Without such improved justification, the diagnostic presented here seems to be best considered as an ad hoc modification of the "probability of positive refractive index squared" diagnostic that, in the authors' views, better captures the properties of linear Rossby waves. I am not sure how useful this is, but I am also not strongly opposed to the paper being published if the editor believes it is useful.

My most significant comment is that it needs to be explained more precisely what the "refractive index" referred to is and what it means physically. Following Sun et al. (2014), the quantity called "n^2" in this manuscript is not the refractive index squared but the vertical wavenumber squared (called, somewhat confusingly in my opinion, "the vertical component of the refractive index" by Sun et al. (2014)). Sun et al. (2014) use "m^2" to represent this, and the same should be done here, as "n^2" is normally used to refer to the refractive index used to understand the direction of propagation in the latitude-height plane. So when m^2 is positive, vertical propagation is allowed.

The authors take the view that larger m^2 values for a fixed zonal wavenumber mean that that wavenumber can propagate upwards more easily (e.g. L301-306) and this is used to design their diagnostic. However, the importance of the magnitude of m^2 for a fixed meridional wavenumber is not clear to me, beyond the literal interpretation. A higher m^2 value would indicate that waves with a greater range of meridional wavenumbers are able to propagate, but the dependence of m^2 on the meridional wavenumber (a key part of this paper) is not interesting as far as this is concerned. The authors could do with giving an explanation or appropriate references to justify their interpretation that higher m^2 values for a given meridional wavenumber indicate that a wave with that specific meridional wavenumber can propagate vertically more easily. This justification is needed to argue that the diagnostic presented here is more than an ad hoc modification of the "probability of positive refractive index squared" diagnostic.

Minor comments:

L21-22 – it would be useful to say again explicitly what quantity has had its probability increased, for clarity.

L79-80 – quotation marks should be put around "very large positive" and "very large negative"

L90-134 – it should be made clearer that the "general knowledge about stationary Rossby wave propagation" refers to that about linear waves, and that the degree to which waves in the real atmosphere behave in this way is not addressed in this paper i.e. the work assumes that linear Rossby wave theory provides a good model.

Table 1 – similarly, it should be made clear here that the "facts" refer only to linear waves.

L108 – I think it would be better to say that "properties of the tropopause" control wave propagation, not the tropopause.

L146-149 – I don't see the statement in Hu and Tung (2007) that there should be a discontinuity in the Rossby wave propagation at the tropopause between 20-40N. What are you referring to here?

L250 – values of what?

L252 – “infers” → “implies”

L264-265 – it's unclear to me what “imprecise information (such as very large or very small refractive index)” means. The punctuation here also has a mistake.

L268-270 – the language is unclear here.

L276 - “final” → “time-mean”. Comma before “some”.

L475-6 - It's not clear to me which feature is being referred to here. It looks like WVR has lower Pr_{Ro} near the mid-latitude tropopause, which doesn't seem consistent with the statement.

L478-480 – this is not clear to me, again since WVR has lower Pr_{Ro} near the mid-latitude tropopause. It will depend on where the wave sources are exactly.

L494-497 - Fig.11 shows that WVR has a lower Pr_{Ro} than SVR in the lower stratosphere between 60-75N, whereas the vertical component of EP flux is higher north of 70N, so the locations of these features don't quite seem consistent.

Fig. 12 – it would be helpful if the axes used were the same as those in fig.11.