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# *Interactive comment on* "Assessing the role of planetary and gravity waves on the vertical structure of ozone over central Europe" *by* Peter Križan

**Anonymous Referee #1**

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The manuscript describes statistics of the lamina appearance in the ozone vertical distribution in dependence of the lamina origin (due to planetary or gravity waves). Thus the subject is well suited to the journal scientific profile. The author uses the methodology elaborated by Teitelbaum et al (1995) to classify the lamina based on the correlation coefficient between vertical profiles of ozone and potential temperature. The reviewer has found interesting and worth publishing results. However, there is a serious problem with selection of the profile data. Thus, the manuscript is not ready for publishing. It may have potential after additional work and resubmission. Table 3 clearly shows that the vertical resolution of the profile should be lower than 100 m for proper identification of the lamina with size less than 1 mPa and less than 500 m



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for the lamina size in the range 1-4 mPa. Figure 12 illustrates strong inhomogeneity of the vertical resolution for all the stations. The same is also seen from Table 2. Lindenberg profiles should be excluded from the analysis because of the large and variable vertical resolution. Thus, the analysed data are not homogeneous that may influence the results. A scale of this effect needs to be evaluated in the revised paper or only the latest results with the high resolution of the ozone profiles should be a subject of analysis. It means that the results shown in Fig.6 should be valid for only two stations since 1990 for the lamina size < 1mPa. For laminae in the range 1-4mPa the analyses will be possible for 3 stations since 1970. Thus in present form Fig. 6 is wrong especially for Lindenberg. Minor problems: l.1-2.The title is not proper: Hohenpeissenberg, Payern, and Uccle are located in the western part of Europe. It is better to change the title to "the midlatitudinal Europe". l.112-116. Have you excluded from the analyses evidently wrong profiles with the correction factor far from 1 ( a case for early Legionowo and Lindenberg ozone profiles)? l.158- 185. This section should be rewritten. In fact, Hohenpeissenberg profiles are not proper for analyses of laminae with size <2 mPa as for almost the whole period the vertical resolution is $\sim$500 m (see Fig.12). The Hohenpeissenberg data are proper for analysis of the laminae with the size > 2 mPa. The author could not state that similar results were derived for other stations, as for Lindenberg (all observations) and Legionowo (early observations before 1990) were not possible to identify correctly lamina with the size <2 mPa. l.190-197. Trend values should appear (% for 10 yr.) with their error estimates to discuss the trend significance. The two-joint lines trend model with the turning point in the mid-1990s needs to applied also for the gravity waves laminae for better comparison with PL laminae. If you calculate the trend based on single line approach for the PL laminae you will probably result with small negative trend as you discussed for the case of the GL lamina trend. l. 215- 220. The discussion is not correct for Payern as this station is located in the valley between the Jura Mountains and Alps.

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