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Interactive comment on "Long-term observation of mid-latitude quasi 2-day waves by a water vapor radiometer" *by* Martin Lainer et al.

Anonymous Referee #1

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The quasi 2-day waves are one of the most extensively observed planetary waves by different ground based and satellite instruments. In this way the most prominent features of the global space distribution and seasonal and intra-seasonal variabilities of these planetary waves have been already known. Most of these features are also well numerically simulated. This paper presents long-term observations of the quasi 2-day waves by a water vapor radiometer at a mid latitude station Bern. The use of water vapor for studying the planetary waves in the middle atmosphere is not a new practice; there are several reports for different planetary waves, as Nielsen et al. (JGR, 2010), Scheiben at al. (ACP, 2014), etc. and particularly for the quasi 2-day waves for example, McCormack et al. (JGR, 2009). There are only a few studies on the interannual variability of the quasi 2-day waves which however have not been able to present con-

vincing results mainly because of not enough long time observations. According to the title of the present paper we expected its main contribution to be namely in clarifying the interannual variability of these waves. However the use of only seven years (October 2010 – September 2017) of water vapor radiometer measurements is shorter time interval than previously used measurements (as for example, Huang et al. (2013) used 10 years of SABER temperature data) and definitely not enough for considering the interannual variability. The use of only single station measurements significantly limits the ability for studying the spatial structures of these waves; only their vertical structure could be considered. The authors however presented only the vertical structure of the wave amplitudes. There is no any information about the wave phases, i.e. it is not possible to understand if the found waves are vertically propagating or trapped waves. The only convincing result from the data analysis is that the quasi 2-day wave activity is stronger in winter than in summer (probably because the summer observations are limited up to about 70 km height). It is mentioned that the large winter wave amplitudes are likely related to SSW but this issue is not particularly investigated. The bicoherence spectra indicated some nonlinear coupling between the quasi 2-day wave, diurnal tide and quasi 18-hour oscillation, but this is a well known result reported in many papers.

General comment: This study suffers from the lack of new scientific results. If the authors want to add values to these single station measurements they have to combine them with the satellite observations and to make an attempt to clarify if the quasy-2-day waves they observe belong to some of the known modes or are a combination of a few modes. Without such information and the lack of any phase results the present paper shows only the observations of quasi-2-day oscillations, nothing more.

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