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The two-core longitudinal structure of meridional wind in the middle atmosphere

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One of key stratospheric processes is the Brewer-Dobson circulation, which includes meridional transport. Kozubek et al. (2015) disclosed the existence of the two-core longitudinal structure in meridional wind at 10 hPa in January. Here the two-core structure in meridional wind is analysed based on MERRA data over 1979-2012 in order to find the altitudinal and seasonal dependence of this two-core structure and its other properties (long term trends). The two-core structure covers the middle stratosphere (lower boundary ∼50 hPa), upper stratosphere and lower mesosphere (up to at least 0.1 hPa). It is circulation response to the appearance of blocking Aleutian pressure high, which affects more or less also zonal wind, temperature and ozone fields. The well-pronounced two core structure occurs only in the winter half of the year (October-March) and only at the Northern Hemisphere. It displays a westward shift with increasing altitude. The two-core longitudinal structure in meridional wind is persistent feature; only a few winters (Januaries) display more complex structure. The problem with trends in December is discussed.