



The QBO modulation of the SAO

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The QBO signature in the upper stratosphere and mesosphere is analyzed from MAECHAM5 and HAMMONIA general circulation models. Our results show that the QBO signature at these levels is significantly linked to the stratospheric QBO. The QBO modulates the altitude of maximum descent of the SSAO westerly and easterly phases and also affects the amplitude of the SSAO easterly phase.

The obtained results demonstrate how the vertical propagation of the QBO signature above the low mesosphere depends on the vertical phase structure of the SAO and consequently on the seasonal cycle. During the solstices SAO westerlies prevail in the middle and upper mesosphere, the QBO signature is only observed around the stratopause, where SAO easterlies dominate. However, during the equinoxes, when MSAO easterlies dominate in the middle-upper mesosphere, the QBO signature extends throughout the mesosphere and low thermosphere. The QBO directly modulates MSAO easterlies causing a variation on the height at which they are generated in the upper mesosphere. Above this layer, a significant QBO signal is also observed on the MSAO westerlies occurring in the mesopause region during the equinoxes.