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Interaction of the solar cycle and the QBO in HAMMONIA simulations

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Signals of the 11 year solar cycle in temperature, circulation and composition of the atmosphere from the upper atmosphere down to the surface are investigated by numerical simulations with the HAMMONIA model. A special focus is to understand better if and how the effects of the 11 year solar cycle interact with the QBO or with the QBO effects. The main questions are: (1) Does the 11-year solar cycle modify the QBO structure, and (2) Do 11-year solar cycle effects in the Northern hemisphere vortex depend on the QBO phase? Two 30 year experiments with static solar maximum and minimum irradiation, respectively, and internally simulated QBO are analyzed for differences in the QBO structure and solar&QBO signals in the Northern hemisphere polar vortex.