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Global distributions and seasonality of HDO and δD in the upper troposphere and stratosphere derived from Envisat/MIPAS observations

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Based on observations of thermal emission in the mid-infrared the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) instrument on board the Envisat satellite provides information on a vast number trace gases. Throughout June 2002 to March 2004 the MIPAS instrument performed observations with its nominal spectral resolution of 0.035 cm-1. Data from this time period were utilised to derive global distributions of HDO and the isotopic ratio δD in the upper troposphere and stratosphere. In the presentation we focus on the tape recorder in the tropical lower stratosphere and the monsoon circulations over Asia and North America. The MIPAS observations exhibit a pronounced tape recorder signal in H_2O, HDO and δD and highlight the importance of convectively lofted ice for the water vapour budget in the lower tropical stratosphere. Clear signatures of the monsoon circulations are observed by MIPAS, visible as a significant enhancement in HDO and an isotopic enrichment in δD. A comparison of the MIPAS results with observations of the ACE-FTS instrument on board SCISAT will be presented.