



Water vapour in the tropical UT/LS from balloon observations with FLASH-B hygrometer

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We present series of in-situ water vapour measurements using balloon FLASH-B Lyman-alpha hygrosonde flown during SCOUT-AMMA balloon campaign in Niger, TC4 campaign in Costa-Rica and SOWER campaign in Indonesia. Vertical profiles of water vapour obtained with FLASH-B above Western Africa in August 2006 during SCOUT-AMMA and accompanying them backscatter and ozone measurements clearly indicate signatures of cross-tropopause transport of ice particles hydrating lowermost stratosphere. Cases of supersaturation inside and outside the clouds in the upper troposphere are considered. Frequent humid layers above the cold point tropopause observed in the profiles suggest that deep overshooting convection could detrain humid tropospheric air directly into the lower stratosphere up to 450 K potential temperature level and enhance its water vapour content. This assumption is supported by evident correlation between the observed moist layers in the lower stratosphere to convective overshoots upwind detected using Meteosat Second Generation brightness temperature images and backward trajectory analysis. Also presented here are the results of simultaneous water vapour soundings with FLASH-B and CFH hygrometers during NASA TC4 campaign held in August 2007 in Costa-Rica. The measurements reveal good agreement between the hygrometers and point out various processes in the tropopause layer and lower stratosphere. The stratospheric profiles ranging up to 30 km carry the signature of “tape recorder” signal and differ from the SCOUT-AMMA

observations obtained during the same season.