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Aerosols and transport in the tropical UTLS as deduced from CALIPSO lidar observations

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This work deals with the study of aerosols in the tropical UTLS and transport processes responsible for their time evolution from the first two years observations of the CALIOP lidar carried on the French-US CALIPSO satellite launched in May 2006. Stratospheric aerosols retrieval algorithms developed have shown: a) the impact of medium-scale volcanic eruptions which represent an important source of aerosols in the stratosphere, ignored until now; b) the decoupling of the mid- and lower stratosphere at 20km separated by a region of zero vertical velocity, surmounted by the slow ascent of the Brewer-Dobson circulation modulated by the Quasi-Biennal Oscillation; c) the injection of clean air until 20km in the equatorial region during the boreal winter, likely washed out in the troposphere and rapidly transport in the most convective regions located above the tropical continents of the south hemisphere. d) the occurrence of aerosols between 15 and 18km above West Africa and Asia during their respective monsoon season, which could be small mineral dust lifted by convection from Sahara and Gobi deserts.