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Analysis of cirrus optical properties in convective outflow during Hibiscus campaign

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Microlidar measurements onboard a long-duration stratospheric balloon show the presence of cirrus clouds in tropical convective outflow. Observation were carried out in the frame of the HIBISCUS campaign held in Bauru (Brasil,22°S) in 2004 and dedicated to tropical UT-LS survey. Observations of upper tropospheric cirrus show high mesoscale variability in height, thickness and optical properties. Observations show that layers are characterized by different optical properties. Trajectory analysis and tracer transport mesoscale simulations show that cirrus deck is formed in the outflow of a large and persistent convective region. Satellite images are used to characterize convective lifetime and to validate the model simulations. The estimate of cirrus convective age is done through mesoscale simulations of convective transportof a lower-tropospheric passive tracer. The analysis show that observed differences in optical properties can be clearly linked to the different residence time of convective-processed air in the upper troposphere.