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## Study of material and energy flow with radar/lidar observations from Equatorial Atmosphere Radar site

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We use the Equatorial Atmosphere Radar (EAR) site as a center for observations with radar, lidar, and other instruments. Target of the study is material and energy flow of the equatorial atmosphere. In this project we plan to install multi-channel receiver system to the EAR, and conduct radar imaging of the atmospheric turbulence and ionospheric irregularity. Also we will renew the boundary layer radar and X-band Doppler radar to reveal generation, propagation and dissipation of atmospheric waves. Based on the existing lidar system in the EAR site, we develop "new multi lidar system" for the study of cirrus structure, troposphere-stratosphere airflow, and layered structures of metallic atoms in the mesosphere. We also introduce a Doppler scanning lidar for studies of the cloud system and its generation, together with sampling of the atmosphere by means of unmanned plane. The presentation introduces whole study project.

Keywords: equatorial atmosphere, Equatorial Atmosphere Radar, equatorial fountain, central observatory