# Study on the Elementary Process of Global Current System Generation from Polar to Equatorial Region

# Akimasa Yoshikawa[1]

[1] Dept of Earth and Planetary Sci., Kyushu Univ

By using a diagram method, which can describe the electromagnetic response of Magnetosphere-Ionosphere-Atmosphere-Solid Earth coupled system, we analyze an Elementary process of global current system from polar to equatorial region. Obtained scenario is as follows: 1. When the field aligned current (FAC) incident on the polar ionosphere, un-shielding FAC, which not shielded by the ionospheric conductive current become a voltage generator in the atmospheric duct, and it launches a transverse magnetic field (TM) waveguided mode. 2. Global rotational Hall current system can be excited by the electromagnetic response during a growing and propagating process of potential divergent electric field of TM mode from polar to equatorial regions.

By using a diagram method, which can describe the electromagnetic response of Magnetosphere-Ionosphere-Atmosphere-Solid Earth coupled system, we analyze an Elementary process of global current system from polar to equatorial region. Obtained scenario is as follows: 1. When the field aligned current (FAC) incident on the polar ionosphere, un-shielding FAC, which not shielded by the ionospheric conductive current become a voltage generator in the atmospheric duct, and it launches a transverse magnetic field (TM) waveguided mode. 2. Global rotational Hall current system can be excited by the electromagnetic response during a growing and propagating process of potential divergent electric field of TM mode from polar to equatorial regions.