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Ordinary existing magnetic micropulsations and their relation to small-scale magnetic fluctuations over the ionosphere

Toshihiko Iyemori¹, Kunihiro Nakanishi^{1*}, Yasuharu Sano², Hiroshi Hanado³, Ichiro Tomizawa⁴, Sadato Yamanaka¹

¹Graduate School of Science, Kyoto Univ., ²Asahi University, ³NICT, ⁴The University of Electro-Communications

Magnetic pulsations with period around 4 minutes have been observed on the ground in many occasions, for example, just after the earthquakes such as 2004 Great Sumatra Earthquake or strong volcanic eruptions such as 1991 Mt. Pinatubo eruption. These pulsations are supposed to be generated through the ionospheric dynamo caused by the vertical acoustic resonance between the ground and the ionosphere. Although the amplitude is small, similar phenomenon is generally observed when the lower atmosphere is disturbed by, for example, typhoons, inland earthquakes, etc. Recent observation suggests that they cause not only the ionospheric currents but also the field-aligned currents. We summarize these results, in particular, of geomagnetic observation and discuss the mechanism.

Keywords: magnetic pulsation, acoustic gravity wave, micro-barometric variation, ionospheric dynamo, field-aligned current, lower atmospheric disturbances