

Tomography-like reconstruction of spatial distribution of the radio induced optical emissions (RIOE) at different wave lengths

T. Sergienko¹, U. Brändström¹, B. Gustavsson²

¹*Swedish Institute of Space Physics, Kiruna, Sweden*

²*Department of Physics and Technology, University of Tromsø, Tromsø, Norway*

e-mail: tima@irf.se

On 19 October 2012, during the EISCAT heating experiment, strong RIOE were observed, in first time, for X-mode ionosphere pumping. The optical emissions were detected by ALIS from four stations simultaneously in three different wave lengths. Multistation observations allow reconstructing the spatial distribution of the enhanced optical emissions. Comparison of the emission spatial distribution for O and X – mode shows that for X-mode ionospheric pumping the optical emissions are formed by accelerated electrons only. In contrast, the O-mode radio wave interaction with ionospheric plasma leads to strong increasing of the temperature of ionospheric electrons that play important role in the 'red' emission (630.0 nm) excitation. Usage of the spatial distribution of volume emission rate for estimation of the characteristic energy of accelerated electrons are discussed.