

Polarization of “modulation lanes” as a probe for diffractive models of Jovian decametric radio emission

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We consider of polarization features of “modulation lanes” of Jovian decametric radio emission which are result of Jovian DAM emission propagation through the interference screen deposited in the Io plasma torus. The point is that in the Io plasma torus the elliptically polarized Jovian radiation propagate as two independent coherent modes, ordinary (o-mode) and extraordinary (e-mode), with approximately equivalent intensities. So, two waves with the circular polarization and the different plane-of-polarization rotation and refraction indexes fall to the interference screen. In according to the diffraction theory the intensity of ordinary and extraordinary wave passing through the diffraction screen has the maximum in the different directions. Therefore, the modulation lanes with the opposite polarization are evidently shifted relatively each other. Our estimation shows that the value of the shift can reach about 10^8 cm at the distance of Earth’s orbit. Observation of polarization fine structure of the “modulation lanes” will allow to identify the left and right polarization lanes, and, as result, to evaluate the parameters of an interference screen in Io’s plasma torus.