

Abstract Submitted
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Plasma diagnostic over prominent oxygen triplets VLADIMIR MILOSAVLJEVIC, NCPST-School of Physics, DCU, Dublin, Ireland & Faculty of Physics, University of Belgrade, Serbia, ALBERT R. ELLINGBOE, STEPHEN DANIELS, NCPST-School of Physics, DCU, Dublin, Ireland — The plasma chemistry of fluorocarbon–oxygen–argon discharges and its influence on prominent oxygen triplets are presented. We investigate a cascade dependence of energy levels of the three oxygen triplets to the 777 oxygen triplet. The 777 triplet is very important for the measurement of atomic oxygen in low pressure plasmas, since the 777.417 nm spectral line is frequently used for actinometry. A carbon rich emission spectrum also has an influence on emission of the oxygen triplet spectral lines by including new lines, as well changing the spectral line shapes of existing oxygen lines. There is a link between emission of a couple atomic carbon lines (around wavelength 601 nm) and the oxygen spectral lines from 777 triplets. The experiments were performed in an Radio Frequency (RF) dual–frequency discharge chamber from Lam Research “EXELAN[®],” with drive frequencies 2MHz and 27MHz. Working gases are Ar–O₂–C₄F₈ mixtures, the total pressure was varied from 2 to 6 Pa. The RF powers of the lower frequency generator were varied from 0 to 600 W, and for the higher frequency generator the power was varied from 0 to 1200 W. Optical observations were carried out using a high resolution spectrometer with an ICCD camera and a low resolution spectrometer.

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