

## **THE ROLE OF SPECTRAL LINES SELF-ABSORPTION IN THE DETERMINATIONS OF THE PLASMA PARAMETERS**

**Ida L. Babich, Viacheslav F. Boretskij and Anatoly N. Veklich**

*National Taras Shevchenko University of Kyiv, Radiophysics Faculty,  
Volodymyrs'ka 64, 01033 Kyiv, Ukraine*

*E-mail: babich@univ.kiev.ua, boretskij@univ.kiev.ua, van@univ.kiev.ua*

Self-absorption of a spectral line leads to deformation of its shape. Therefore, diagnostics of plasma properties by optical emission spectroscopy techniques become more complicated. The aim of this work is to estimate the influence of spectral lines self-absorption on the determinations of plasma properties. The electric arc discharge was used as the origin of spectral line emission. The arc was operated at atmospheric pressure in different experimental modes. The arc image was focused on the entrance slit of monochromator. The emission of spectral line was recorded by linear CCD image sensor. The plasma temperature was determined by relative intensities or Boltzmann plot techniques. To determine the radial profile of electron density we investigated the shape of several copper spectral lines broadened by the dominating quadratic Stark effect. The Fabry-Perot interferometer (FPI) was used to study the broadening of these lines in different points of the plasma volume. Self-reversal spectral lines were observed. The effect of this phenomenon on the determinations of the plasma parameters was estimated.