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Spectroscopic determination of excited atomic states populations in CCP AR discharge KONSTANTIN KURCHIKOV, ALEXANDER KOVALEV, ANNA VASILIEVA, OLEG BRAGINSKY, Nuclear Physics Institute, Moscow State University, Moscow, Russia — Capacitive Coupled Plasmas (CCP) is being used for plasma processing of different kinds of materials, including low-K films. One of main factors of Low-k damage is ultraviolet radiation of plasma. So control of density of high excited atomic levels is of big importance. For quantitative description of the plasma we have built multilevel Collisional Radiative Model with account of optical thickness effect. The model was tested by comparison of experimentally measured and calculated populations of four first excited levels $3p^5 4s$ of Ar atom. Levels' populations have been determined experimentally by two methods: 1) measurements of lines intensity for plasmas with different effective sizes, 2) by comparison of intensities with two lines with the same upper level and differently absorbing lower levels. Dependences of levels' populations on plasma parameters have been analyzed.

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