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THE BROAD LINE REGION OF AGN: KINEMATICS AND PHYSICS (Serb. Astron. J. № 173 (2006), 1)

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In the paper Popović 2006, an error appeared in derivation of Eqs. (5)-(8) of Section 3.2. The whole paragraph containing that derivation should be replaced by the following:

On the other hand, one cannot expect a homogeneous distribution of physical parameters and density of emitters along the line of sight. But, if we still have the population following the Boltzmann-Saha equation, Eq. (1) can be written as:

$$I_{lu} = \frac{hc}{\lambda} g_u A_{ul} \int_0^{\ell} \frac{N_0(x)}{Z} \exp(-E_u/kT_e(x))dx \quad (5)$$

If we assume that the temperatures across the BLR vary as $T(i) = T_{av} \pm \Delta T_i$, and emitter density as $N_0(i) = N_0^{av} \pm \Delta N_0(i)$, the Eq. (5) can be written as:

$$\begin{aligned} I_{lu} &= \frac{hc}{\lambda} g_u A_{ul} \frac{N_0^{av}}{Z} \times \\ &\times \sum_1^n (1 + \delta N_0(i)) \exp\left[-\frac{E_u}{kT_{av}(1 + \delta T_i)}\right] \ell_i, \quad (6) \end{aligned}$$

where $\delta T_i = \Delta T_i / T_{av}$ and $\delta N_0 = \Delta N_0 / N_0^{av}$. If in a BLR the temperature and emitter density do not vary too much, i.e. $\Delta N_0/N_0 << 1$ and $\Delta T_i/T_{av} << 1$, the Eq. (6) becomes

$$I_{lu} = \frac{hc}{\lambda} g_u A_{ul} \frac{N_0^{av}}{Z} \exp(-E_u/kT_{av})\ell \quad (7)$$

meaning that the Eq. (4) can be used to determine T_{av} in the BLR.