X25a **A comparison of Lyman continuum of population synthesis models and their difference in emission lines of galaxies**

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Stellar population synthesis models are a standard tool for extragalactic studies. There are several models and a comparison in their NIR predictions had been discussed. On the other hand, a comparison in Lyman continuum ($\lambda < 912$ Å) is relatively rare, while the Lyman continuum is very important since it has a direct connection to emission lines of galaxies. The Lyman continuum emissivity of galaxies is also a key quantity controlling the cosmic reionization at $z > 6$. Here, we present such a comparison. We focus on three quantities describing the Lyman continuum: hydrogen ionizing photon rate, $Q_{\rm HI}$, helium singly ionizing photon rate, $Q_{\rm HeI}$, and helium doubly ionizing photon rate, $Q_{\rm HeII}$. We find that the ratio of $Q_{\rm HI}/Q_{\rm HeI}$ is stable within about 0.1-dex among the population synthesis models, which we compared, as a function of age and metallicity. On the other hand, the ratio of $Q_{\rm HI}/Q_{\rm HeII}$ shows 2 orders of magnitudes or more difference among the models for metallicity larger than 1/10 Solar value. As a result, ratios of higher ionization emission lines, especially He II lines, to hydrogen lines like Hβ vary a few orders of magnitudes among the models for that metallicity. Another interesting finding is a factor of 2 enhancement of $Q_{\rm HI}$ in recent models including massive binary population or stellar rotation relative to other classical models. This enhancement, for example, linearly affects the Hα emissivity which is thought as the best star formation tracer. If this is the case, we should revisit a concordance among Hα, UV, and IR star formation rates of galaxies obtained with a dust attenuation recipe.