STELLAR POPULATIONS IN HIGH-z GALAXY MERGERS

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We investigate the nature of stellar populations of major galaxy mergers between late-type spirals considerably abundant in interstellar medium by performing numerical simulations designed to solve both the dynamical and chemical evolution in a self-consistent manner. We particularly consider that the star formation history of galaxy mergers is a crucial determinant for the nature of stellar populations of merger remnants, and therefore investigate how the difference in star formation history between galaxy mergers affects the chemical evolution of galaxy mergers.

We found that the rapidity of star formation, $C_{\rm SF}$, which is defined as the ratio of the dynamical time-scale to the time-scale of gas consumption by star formation, is the most important determinant for a number of fundamental characteristics of stellar populations of merger remnants. The mean stellar metallicity ($\langle Z_* \rangle$) of the model with larger $C_{\rm SF}$ is larger than that of the model with smaller $C_{\rm SF}$. If galaxy mergers with larger $C_{\rm SF}$ become more luminous elliptical galaxies, the relation between $C_{\rm SF}$ and $\langle Z_* \rangle$ corresponds to *the mass - metallicity relation* which is the conventional interpretation of *the color - magnitude relation.* A negative metallicity gradient fitted by a power-law is reproduced by a dissipative galaxy merger with star formation. In our models, the heavy elements ejected from stars are more efficiently trapped by the stellar component than by the gas component ('chemical segregation'). This result may provide a solution for the *"iron abundance discrepancy problem"*. More detailed discussions are published in Bekki & Shioya (1997a,b).

References

Bekki, K., & Shioya, Y. 1997a, *ApJ*, **486**, 197
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