

IV. Concluding Remarks

CONCLUDING REMARKS OF THE I.A.U. COLLOQUIUM NO.108

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The discussions during the colloquium clearly pointed to the recent rapid progress in applying the atmospheric models to the detailed diagnostics of stellar evolution.

The high-quality spectroscopic data now available enable us to evaluate the abundances of scarce elements and isotopes in the classical stellar atmospheres. Many of them are found to be useful to sound the mixing and the gravity settling phenomena in the stellar interior. Extensive contributions were presented about the former process in the AGB stars, and about the latter process in the Li-deficient F stars.

The evolutionary interactions between the stellar interior and the atmosphere become distinct when the mass-loss processes set in. It was pointed out that high-rate mass loss can influence the internal evolution and mixing on one side, and that on the other side the mixing (dredging-up) can change the abundances of heavy elements in the atmosphere and further modulate the mass-loss rate. Many speakers presented ample of observational data from UV to mm-wave range indicating occurrences of substantial mass loss from various kinds of stars. Self consistent models with spherical geometry were proposed for stellar winds which are driven by the radiation pressure acting on ions or dust grains. This involves comprehensive calculation related to the molecular chemistry and the grain physics. So far as the flow is stationary and spherically symmetric, the escape velocity and the mass-loss rate determine the density structure of the wind in radiative equilibrium.

The colloquium was enlivened by the timely appearance of SN1987A whose topics dominated in the session of exploding stars. In order to obtain the direct information of the chemical structure of the progenitor, several contributors modelled the expanding envelope using a simple power law or a similarity solution for density structure. The spherical symmetry and the radiative equilibrium were mostly assumed in fitting the models to the observed spectra and energy distributions. Except for few cases the investigators found satisfactory solutions of parameter sets and chemical abundances for the expanding atmosphere of SN1987A at various epochs. They were most elaborated model calculations ever done for dynamical atmospheres to provide the diagnostics of SN explosion.

These models of expanding atmospheres, however, involve more parameters than the classical static atmospheres. The influences of each physical parameters on the observational quantities must be carefully investigated. The assumption of spherical symmetry and the radiative equilibrium may not be valid over all phases of the development of SN1987A whose speckle image was reported to be elongated.

This colloquium was one of the rare chances where the researchers specialized for stellar atmospheres and those for internal structure could be engaged in direct discussions over a wide range of concrete subjects. It is certainly not only the present reviewer but also all of the participants who found this conference for fruitful and pleasant, with the most effective poster- and the "beer" sessions.

In conclusion, on behalf of all the attendants I would like to congratulate SOC chairmen, Drs. Nomoto and Kudritzki, and LOC chairman, Dr. Tsuji, on their success in organizing this colloquium.