EFFECTS OF DUST EXTINCTION IN GALACTIC DISCS

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We have solved the radiative transfer equation taking into account both absorption and scattering into the line of sight to the observer to model the disc of spiral galaxies.

A dust model has been adopted, suitable for the diffuse interstellar medium of our Galaxy, to obtain, in all the considered spectral range (1000 ÷ 10000 Å), consistent quantities to describe both the absorption and the scattering properties of the dust.

New extinction curves, showing the internal absorption in a spiral galaxy, both if the scaleheight of stars and dust is the same (*case A*) or different (*case B*), have been derived (?). The most important results are the following:

1. The neglect of the scattering source is a hard approximation. In fact at $\tau_V = 0.72$ the overestimate of the internal absorption is of the order of 40% when the scaleheights of stars and dust are the same, and about 25 ÷ 30% if the scaleheights are different. Moreover it increases with the optical depth.
2. The scattering deeply changes the shape of the observed mean interstellar galactic extinction curve. For instance the UV–bump, at $\lambda = 2200$ Å is lower and larger; the slope in the optical region is different.
3. The behaviour of the colour excesses, for *cases A* and *B*, as function of the optical depth, is different.
4. The use of the C parameter defined in studies of the surface brightness of differently inclined spirals, to infer the optical thickness is misleading, unless the C values are < 0.45. For $\tau > 2 \div 3$ in *case A*, C becomes negative.

References

Di Bartolomeo, A., Barbaro, G. & Perinotto, M., *MNRAS*, 1995, *accepted*