

HIGH RESOLUTION LONG-SLIT SPECTROSCOPY OF A78

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ABSTRACT. High spectral resolution bidimensional spectroscopy of A78 in the He II $\lambda 4686$ Å, H $\lambda 4861$ Å, [O III] $\lambda 4959$ Å and [O III] $\lambda 5007$ Å lines is reported, confirming the different morphology of the nebula in these lines. The resulting velocity maps suggest different episodes in the history of the nebula, with an external hydrogen-rich layer expanding at low velocity (35 ± 10 km/s), showing little structure and extending from approximately 35 to 55 arcsec. The [O III] and the He II maps show, however, an inner shell with at least two different expansion velocities; 73 km/s and 41 km/s.

These data, together with recent low resolution optical data for the nebula (Manchado *et al.* 1987) allow us to calculate the mass of each shell which ranges between $0.024 M_{\odot}$, $0.1 M_{\odot}$ and $0.1 M_{\odot}$ for the inner, intermediate and outer shells respectively and the time scales since the ejection being ~ 1800 yrs for the inner shell, 3500 yrs for the intermediate one and ~ 11900 yrs for the hydrogen-rich more external layer.