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TITLE: The optical emission and extinction structure of Tc 1
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ABSTRACT:
The unique fullerene-rich planetary nebula Tc 1 (PN G345.2-08.8) was observed with VLT MUSE in AO-assisted Wide Field mode to study the spatial distribution of ionized emission (4750-9350A). This low ionization, almost round, PN has an inner ring inside a shell of high surface brightness, surrounded by a lower ionization halo ~1000 times fainter, with dominant [N II] emission. The extinction image derived from the Ha/Hb ratio shows a wealth of structures - a uniform core with an annulus of lower extinction and over the halo patchy extinction with higher extinction clumps. There is also a hint that the central star has increased extinction suggesting a local dust shell. Electron density and temperature have been mapped from the [S II], [Cl III], [N II] and [S III] line ratios and the lower density halo is hotter than the core by about 1800K. Comparison of the optical emission and extinction structures with the Spitzer mid-infrared imaging of the C60 band emission is explored for clues to the formation and excitation of fullerenes.