STELLAR POPULATIONS IN SEYFERT 1 GALAXIES

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Abstract. We present a study of optical (BV) and infrared (JK) colours and colour gradients in a sample of Seyfert 1 galaxies. The galaxies belong to the hard X–ray selected complete sample of Piccinotti *et al.* (Ap.J., **253**, 485, 1982). We separate the luminosity profiles of the galaxies into an AGN, bulge and disk components (Kotilainen *et al.*, MNRAS, submitted), and determine the stellar BVJK colours in the nucleus and in an annulus around it. We use three colours, B–V, V–K and J–K, which are sensitive to different kinds of stars. We find no correlation between optical, optical/infrared and infrared colours in the nucleus or in the annulus. The recent star formation rate (SFR), which determines the B–V colour, must therefore vary considerably from galaxy to galaxy and be separated from the properties of the older stellar population responsible for the infrared colours. Most of the galaxies show a steep negative V–K and a flatter negative J–K gradient (i.e. redder colour towards the nucleus) and a slight positive B–V gradient. These colour gradients are steeper than in E/SO's and globular clusters. The optical and optical/infrared gradients are well correlated, whereas there is no correlation between B–V and J–K gradients. We compare a model (Arimoto and Yoshii, AA, **164**, 260, 1986) with varying initial mass function, star formation rate and age of the galaxy with the observed colours and gradients. While the models can account for normal galaxy colours, the colours of the Seyfert 1 hosts are generally much redder (in V–K and J–K). Explaining the colours and gradients of the sample galaxies requires a combination of internal differential reddening, thermal reradiation from hot dust grains, and metallicity, recent SFR and IMF that change with radius. Extremely red colours of some of the galaxies may need additional contribution from, for example, a very old red stellar population, extreme IMF or an extremely low lower mass cutoff (LMC).

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