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Spatially Resolved Studies of DIBs in Galaxies outside the Local Group

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Diffuse interstellar bands (DIBs) are faint spectral absorption features of unknown origin associated to the interstellar medium (see Herbig 1995). Research on DIBs beyond the Local Group will surely blossom in the era of the ELTs but we can already now start paving the way. In Monreal-Ibero *et al.* (2015), we proposed the use of high-sensitivity IFSs as tools to detect and map DIBs. We used MUSE commissioning data, obtaining the first determination of a DIB radial profile in a galaxy outside the Local Group. Next, we derived the first maps for the DIBs at λ5780 and λ5797 in galaxies outside the Local Group using GTO MUSE data of the Antennae Galaxy (Monreal-Ibero *et al.* 2018). The strongest of the two DIBs (at λ5780) was detected in an area of $\sim 0.6\square'$, corresponding to a linear scale of ~ 25 kpc^2 (see Fig. 1). This region was sampled using >200 out of ∼1200 independent lines of sight. The DIB λ5797 was detected in >100 independent lines of sight. These maps where compared with the 2D distribution of the extinction, atomic and molecular gas, and emission in the mid-infrared. The derived results illustrate the enormous potential of integral field spectrographs for extragalactic DIB research.

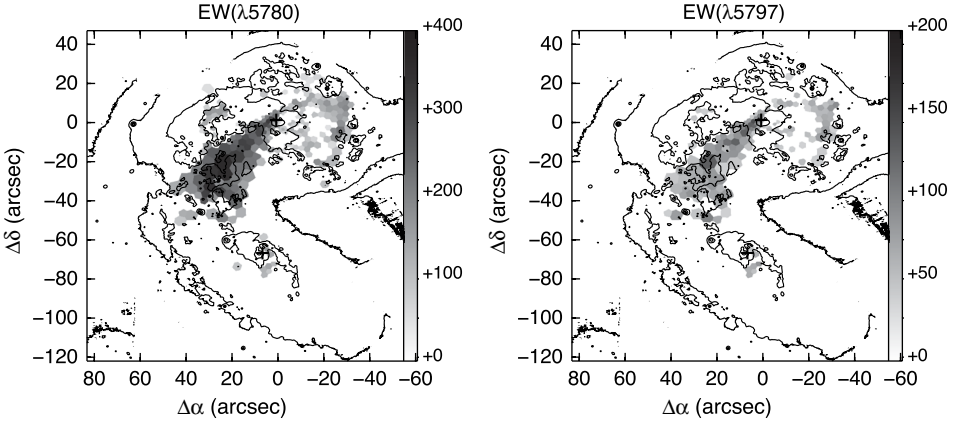

Figure 1. Maps of the derived equivalent width in mÅ for DIBs at λ5780 (*left*) and λ5797 (*right*) in the Antennae Galaxy. The reconstructed white-light image is overplotted as reference with contours in logarithmic stretching in steps of 0.5 dex.

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