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ORIGINAL ARTICLE

# Integral wide-field spectroscopy in astronomy: the Imaging FTS solution

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**Abstract** Long-slit grating spectrometers in scanning mode and Fabry–Perot interferometers as tunable filters are commonly used to perform integral wide-field spectroscopy on extended astrophysical objects as HII regions and nearby galaxies. The goal of this paper is to demonstrate, by comparison, through a thorough review of the imaging Fourier transform spectrometer (IFTS) properties, that this instrument represents another interesting solution. After a brief recall of the performances, regarding FOV and spectral resolution, of the grating spectrometer, without and with integral field units (IFU), and of the imaging Fabry–Perot, it is demonstrated that for an IFTS the product of the maximum resolution $R$ by the entrance beam étendue $U$ is equal to $2.6\,N \times S_I$ with $N \times N$ the number of pixels of the detector array and $S_I$ the area of the interferometer beamsplitter. As a consequence, the IFTS offers the most flexible choice of field size and spectral resolution, up to high values for both parameters. It also presents on a wide field an important multichannel advantage in

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