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# Spaxel segmentation of hyperspectral datacubes based on Gaussian profiles extraction of emission line patterns in CALIFA datacubes

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## Résumé

The CALIFA survey [1] is a set of data cubes obtained at the Calar Alto Observatory with the Integral Field Spectrograph PMAS/PPak for a collection of 900 spiral galaxies selected in the SDSS catalogs at high spatial resolution. To recover the velocity maps of such disc galaxies, we introduce a simple automatic feature-extraction algorithm based on the identification of emission lines selected from a preset library; this is done at each pixel. It uses a first-guess approximation for the wavelength position by extracting a sub-range from the full spectrum.

Each emission line is fitted with a Gaussian profile using Chi-squared optimization; the Doppler shifts are easily converted to velocities. The algorithm uses the redundancy expected from one spaxel position to its neighbours to speed-up the computation of the Gaussian fits. This allows to compute *clean* radial velocity and velocity dispersion maps very efficiently for a subset of galaxies presenting a projection angle between 30-40 degrees or more. The method applies equally well to galaxies with weak or strong spiral arms, and/or a central bar. The library of spectral lines may easily be extended, and the recovery of the velocity field treated in parallel for an application to very large volumes of data.

García-Benito, R., Zibetti, S., Sánchez, S. F., Husemann, B., & al. 2015, A&A, 576, A135. 1409.8302

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