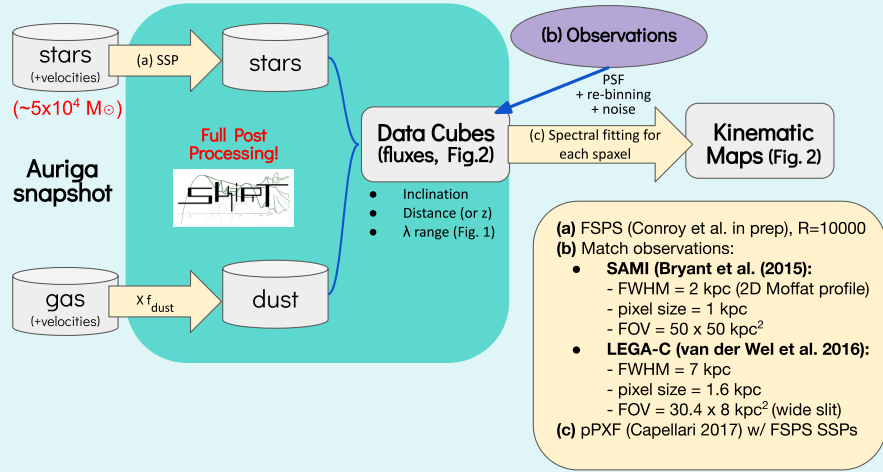# STELLAR KINEMATICS OF SIMULATED GALAXIES FROM SYNTHETIC SPECTROSCOPIC OBSERVATIONS OF OPTICAL LINES USING RADIATIVE TRANSFER

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We present the framework for realistic **mock observations of spatially resolved galaxy spectra**, using state-of-the-art hydrodynamical simulations, stellar population models, **radiative transfer with SKIRT**, and with a particular focus on internal galaxy kinematics.

This is an essential tool for interpreting the high-quality spectroscopic datasets that are becoming available. As a first application we compare the mock observations from the **AURIGA cosmological zoom simulations** with integral-field observations of present-day galaxies from SAMI and long-slit observations of galaxies at large look-back time from LEGA-C.

## METHODOLOGY



**(a)** FSPS (Conroy et al. in prep), R=10000
**(b)** Match observations:
- **SAMI (Bryant et al. (2015):**
  - FWHM = 2 kpc (2D Moffat profile)
  - pixel size = 1 kpc
  - FOV = 50 x 50 kpc$^2$
- **LEGA-C (van der Wel et al. 2016):**
  - FWHM = 7 kpc
  - pixel size = 1.6 kpc
  - FOV = 30.4 x 8 kpc$^2$ (wide slit)

**(c)** pPXF (Capellari 2017) w/ FSPS SSPs

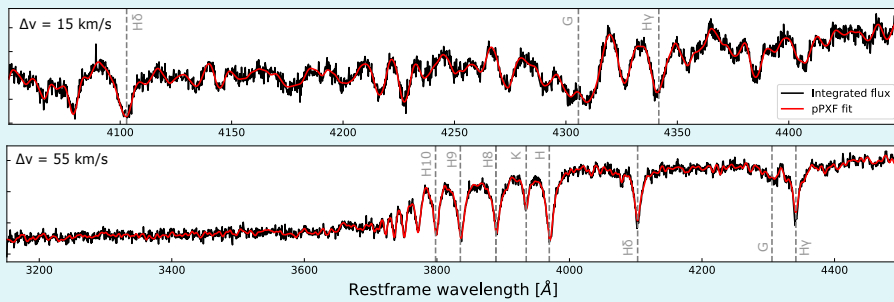## LINE FITTING TO RECOVER KINEMATICS



**Figure 1:** Example spectrum and pPXF fit for a single spaxel in the (top) mock SAMI and (bottom) mock LEGA-C like observations of Halo 6 of the Auriga Project.

## RESULTS

**Figure 2:** Columns represent (from left to right) the integrated flux, line-of-sight velocity and velocity dispersion maps of a simulated Auriga halo. The top row shows the resulting post-processed simulation at a high spatial resolution (0.5 kpc pixels), while the middle row mock observations have been degraded to match SAMI data. Dashed lines represent 1 and 2 times the effective radius of the galaxy. Printed in the figures are the rotation velocity and dispersion within 1 Re. The bottom row shows a simulated LEGA-C slit and the resulting velocity and velocity dispersion curves.