



# First Results from VIPERS



Alexander Fritz,<sup>1</sup> S. de la Torre<sup>2</sup> and the VIPERS Team

<sup>1</sup>INAF-IASF Milano, Italy [afritz@iasf-milano.inaf.it](mailto:afritz@iasf-milano.inaf.it)

<sup>2</sup>SUPA, IfA, Univ. of Edinburgh, Royal Observatory, UK



Galaxy Clustering at  $z \sim 1$

Massive Clusters and Superclusters of Galaxies

Evolution of Galaxies and AGNs

Growth Rate of Universe

Evolution of Galaxy Properties:  $M_*$ , luminosities, colors, SFRs, ...

Weak Lensing

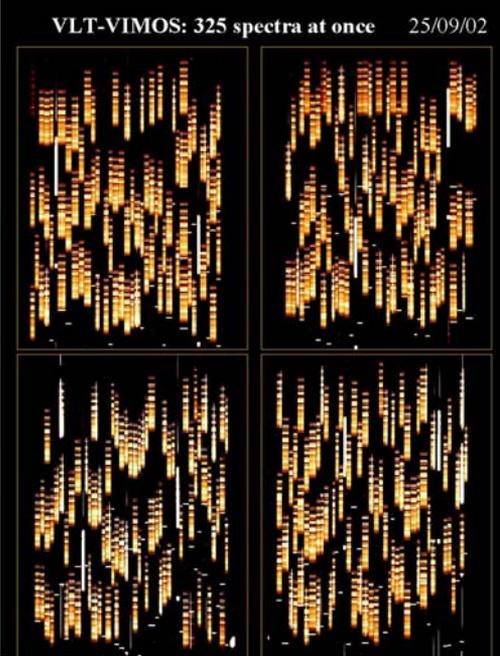
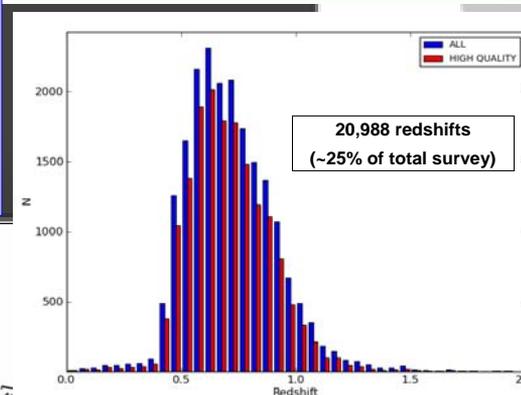
## Introduction

The VIMOS Public Extragalactic Redshift Survey (VIPERS) is an ongoing ESO Large Program to map out in detail the spatial distribution of galaxies and to measure the statistical properties and related cosmological parameters over an unprecedented volume of the Universe at  $0.5 < z < 1.2$  (Guzzo et al. 2011). Based on 5-band accurate photometry from the CFHTLS, VIPERS is using VIMOS at the VLT to measure  $10^5$  redshifts for galaxies down to  $I_{AB} < 22.5$  over an area of  $24 \text{ deg}^2$ . This is the largest galaxy redshift survey ever performed at ESO and comparable to the volume of the 2dF Galaxy Redshift Survey at  $z \sim 0.1$ . There is a great synergy with other wavelengths, e.g. GALEX, UKIDSS SWIRE, VLA, XMM-LSS.

## Status of the Project

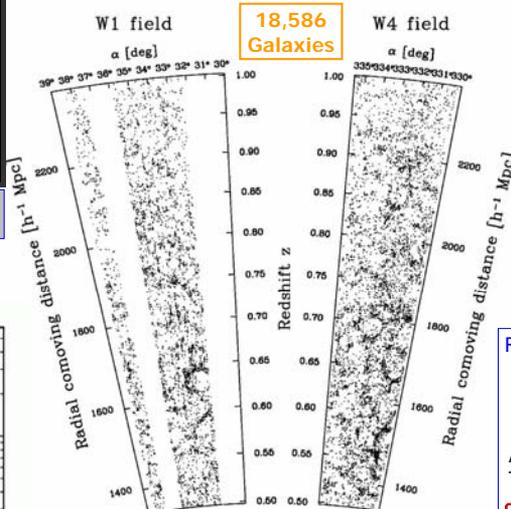
SURVEY STATUS AS OF 01/07/2011

EFFECTIVE GALAXY TARGETS	MEASURED REDSHIFTS	STELLAR CONTAMINATION	COVERED AREA
23377	21290	688 (3.2 %)	25.4 %



Example of a VLT-VIMOS observation. Typically 350 spectra can be gained in a single exposure.

18,586 Galaxies

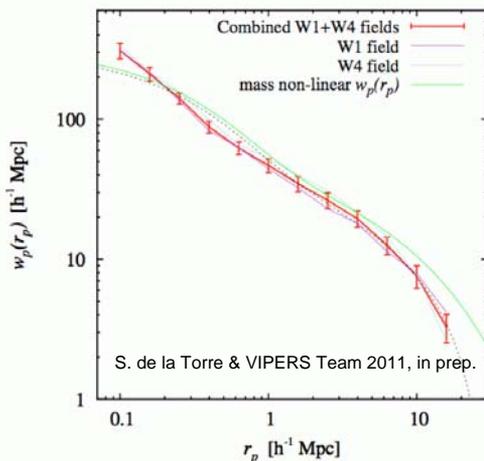


The VIPERS Team 2011, in prep.

First detailed 3D view of the large-scale structure of the Universe between  $0.5 < z < 1.0$ .

VIPERS Webpage: <http://vipers.inaf.it>

## Projected Correlation Function



Projected correlation function  $w_p(r_p)$ , constructed using our new automatic mask algorithm (correcting for vignetting, probe arm vignetting, borders). The correlation function is well defined on  $0.1 < r_p < 12$  scales. Note the remarkably small difference of clustering (amplitude and shape) between the two independent VIPERS fields. The green line shows the  $\Lambda$ CDM model (HALOFIT prediction) with an arbitrary bias of  $b=1.43$ . The dotted line is the same model but including the integral constraint.

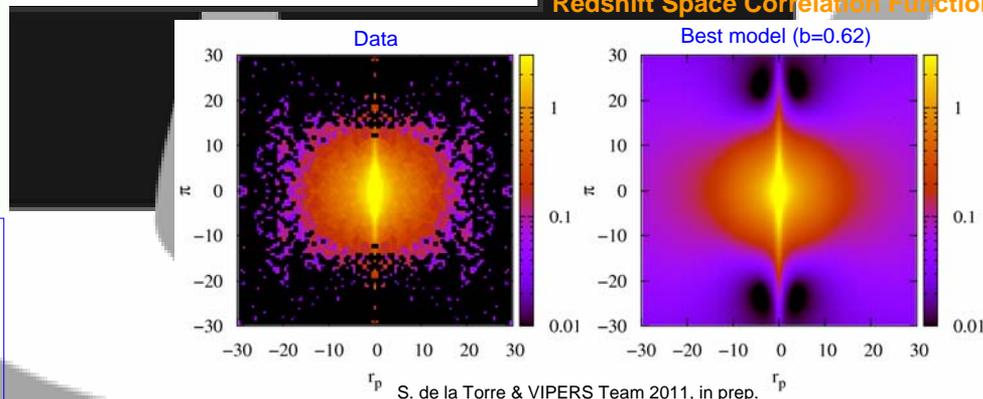
## Galaxy Clusters & Groups

Realistic simulations using Mock catalogs to detect rare massive clusters

- 1 - Which clusters do we find and at which redshift?
- 2 - How many in the total area?

A. Iovino & VIPERS Team 2011, in prep.	Redshift range				SIM	
	0.5-0.65	0.65-0.8	0.8-1.0	TOT		
$\sigma > 700$	all/N>5	15/15	17/16	11/3	44/34	47
$\sigma > 600$	all/N>5	39/39	47/42	35/11	121/92	140

## Redshift Space Correlation Function



Redshift space correlation function  $\xi(r_p, \pi)$  computed from the first  $\sim 12,000$  VIPERS redshifts, showing the squeezing of the contours due to redshift-space distortions. The best-fitting model gives a preliminary value of the distortion parameter  $b=0.62$  and is a two parameter fit to the full shape  $\xi(r_p, \pi)$  out to  $20 \text{ h}^{-1} \text{ Mpc}$ .