A) Summary
We present a multi-wavelength FUV to FIR catalog of Spitzer-selected sources (Data Fusion) over ~60 deg^2 obtained by the Herschel Multi-frequency Extragalactic Survey (Herschel) GT KP. We use this database to determine the FIR/SMM Local Luminosity Function based on Spitzer & Herschel Data, combining optical and NIR photometry with redshift estimates and MIPS & SPIRE observations to optimally identify spitzer & Herschel sources.

We compute the 24, 70, 160, 350, 500 μm as well as the far-infrared (100-1000 μm) local (K<6.4) luminosity function and find derived important local benchmarks for models of the formation and evolution of infrared galaxies.

This Data Fusion and Spitzer-Herschel wide-area observations will soon be enriched by the VISTA/VIDEO and VST/VOICE datasets and will thus allow us to investigate infrared galaxies at all redshifts as well as develop connected points for the small-wavelength follow-up.

B) A Spitzer-Selected Multi-Wavelength Catalog (Data Fusion)

The Data Fusion is a powerful resource to fully sample the non-Spitzer catalogs are matched against IRAC-1 or 2 positions (using nearest-neighbor) and is based on public catalogs as well as in-house re-reductions.

The wealth of Spitzer observations over the ~18 deg^2 of the CDFS, XFLS, # of

Non-Spitzer catalogs are matched against IRAC-1 or 2 positions (using nearest-neighbor) and is based on public catalogs as well as in-house re-reductions.

The Data Fusion is based on Spitzer public catalogs as well as in-house re-reductions.

Combining deep fields such as COSMOS with several Data Fusion shallow fields we can evaluate the Monochromatic & IR Bolometric LLFs using the 1/V_m^2 estimator. We compare our estimates with models and measurements from recent literature.

This will enable much-improved studies of IR LFs (as well as stellar mass functions and star formation rate functions) in fields accessible to ALMA and E-ELT follow-up.

D) MIPS & SPIRE Monochromatic & IR Bolometric LLF

We evaluate the Monochromatic & IR Bolometric LLFs using the 1/V_m^2 estimator.

Comparing our estimates with models and measurements from recent literature, (Poisson) errors are estimated in each field and a weighted mean is then computed.

E) Conclusions and Future Work

We produce a Spitzer-Selected Wide-Area Multi-Wavelength (FUV to FIR, including redshift information) Catalog covering Spitzer and Herschel extragalactic survey fields.

This Work

Combining deep fields such as COSMOS with several Data Fusion shallow fields we can more reliably probe the FIR/SMM Luminosity Function at both the faint and bright end and will be expanded using VISTA/VIDEO & VST/VOICE datasets in ideal fields for E-ELT follow-up.

Mattia Vaccari (SKA SA Fellow, University of the Western Cape, Cape Town, South Africa)
Lucia Marchetti (Padova, IT), Eduardo Gonzalez-Solares (Cambridge, UK) & Herschel Consortium