LARGE SKY AREA MULTI-OBJECT FIBER SPECTROSCOPIC TELESCOPE (LAMOST) COMPLETE SPECTROSCOPIC SURVEY OF POINTING AREAS (LCSSPA) AT SOUTHERN GALACTIC CAP

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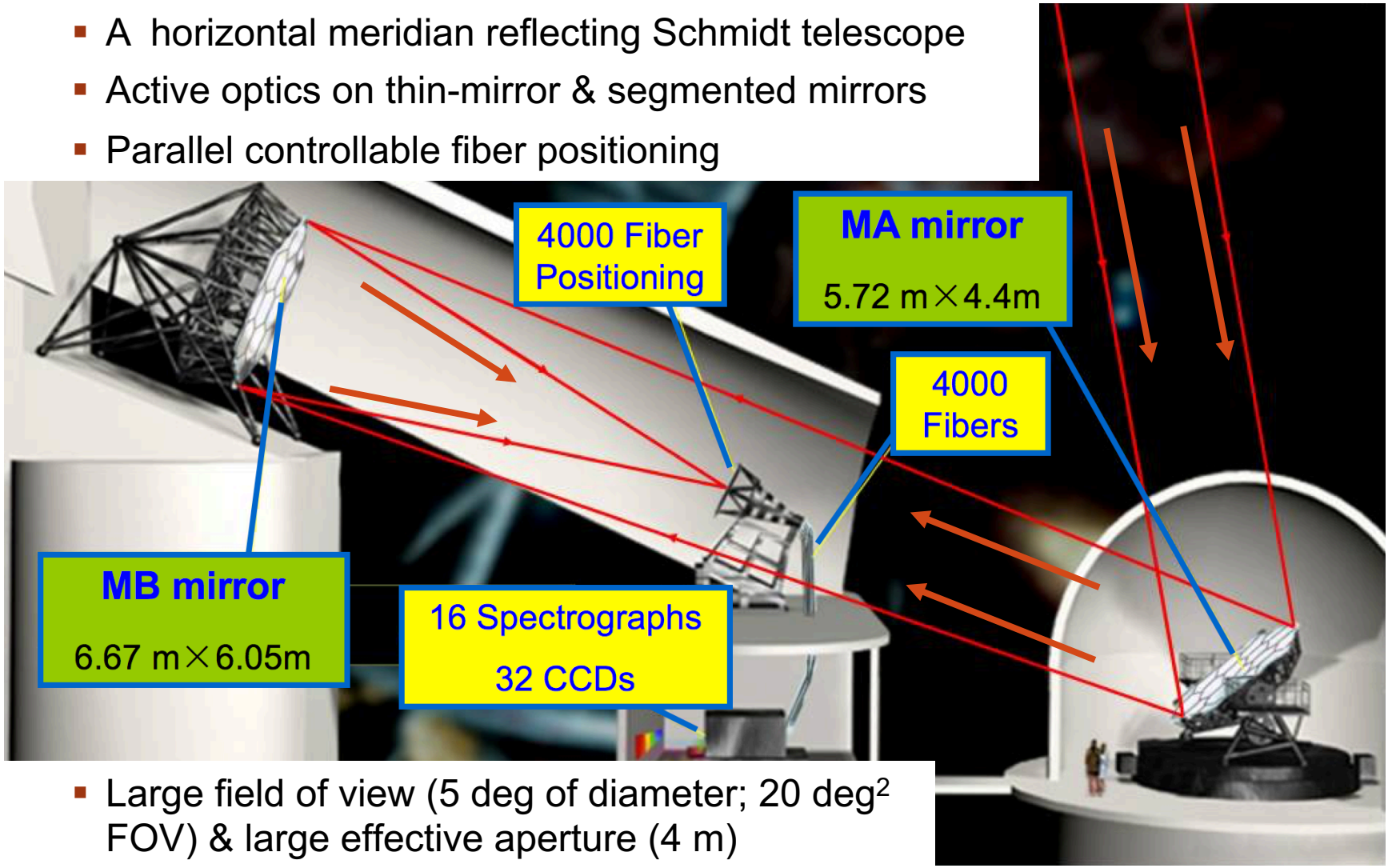
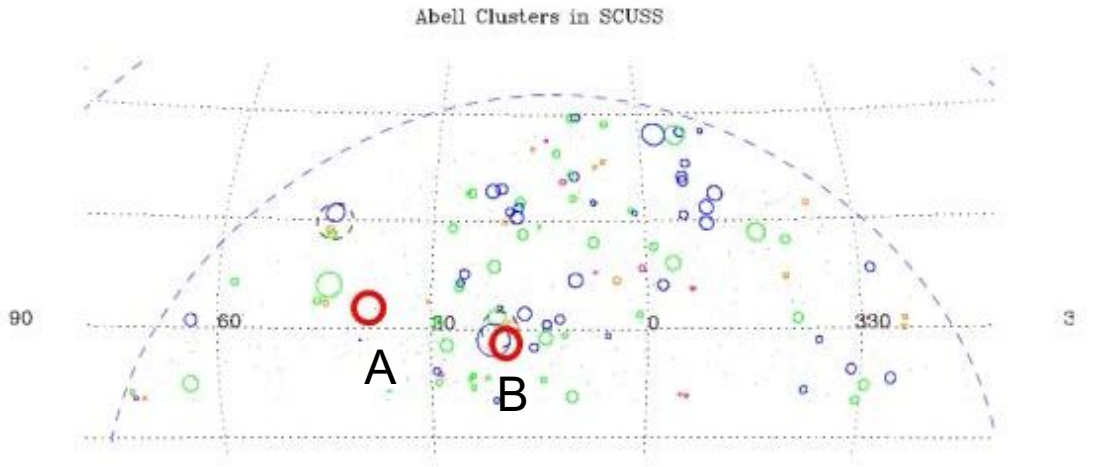
STRUCTURE OF LAMOST

- A horizontal meridian reflecting Schmidt telescope
- Active optics on thin-mirror & segmented mirrors
- Parallel controllable fiber positioning



- Large field of view (5 deg of diameter; 20 deg^2 FOV) & large effective aperture (4 m)

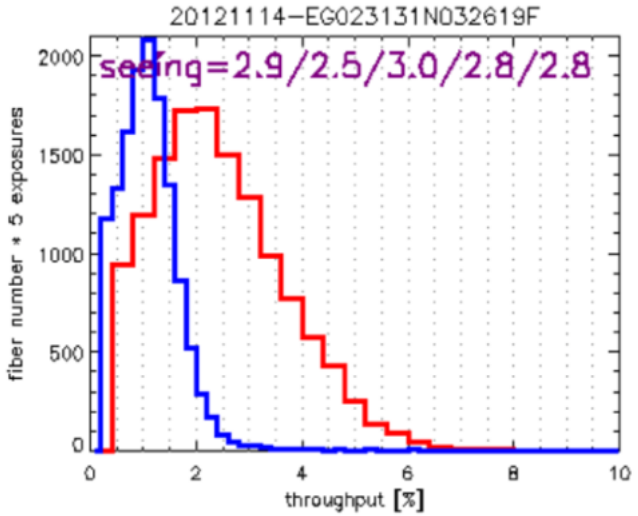
ABOUT LCSSPA



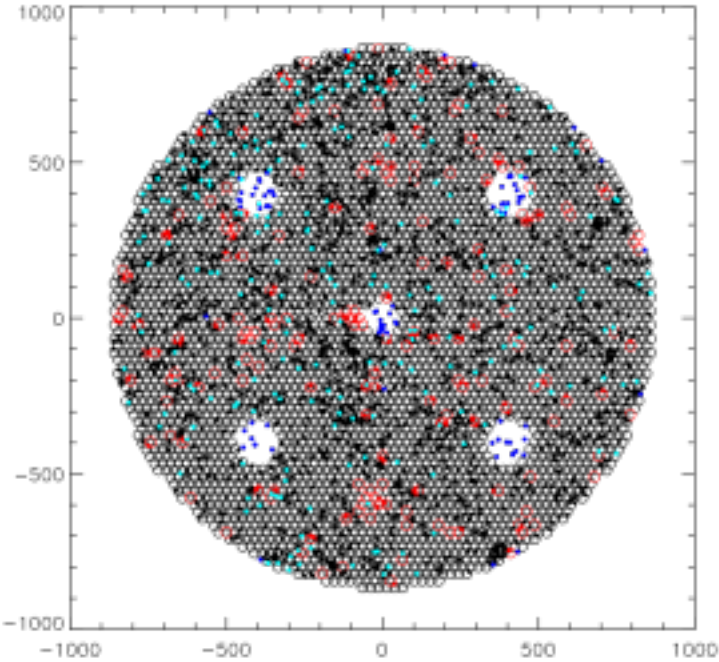
- Method:
  - Two 20 deg^2 of FOV in the southern galactic cap (different number density of galaxies)
  - Spectroscopic observations for all source (Galactic and extra-galactic)
  - Limiting magnitude r=18.1 mag (0.1 mag deeper than LAMOST design)
- Main Goals:
  - The completeness of LAMOST ExtraGAlactic Surveys (LEGAS)
  - The basic performance parameters of the LAMOST telescope
  - The deficiencies of target selection methods
- Other research works:
  - The cluster of galaxies
  - The Luminous Infrared Galaxies (LIRG) and Ultra Luminous Infrared Galaxies (ULIRG)
  - The time-series variable sources (e.g., QSOs, AGNs and variable stars)
  - The infrared excess stars

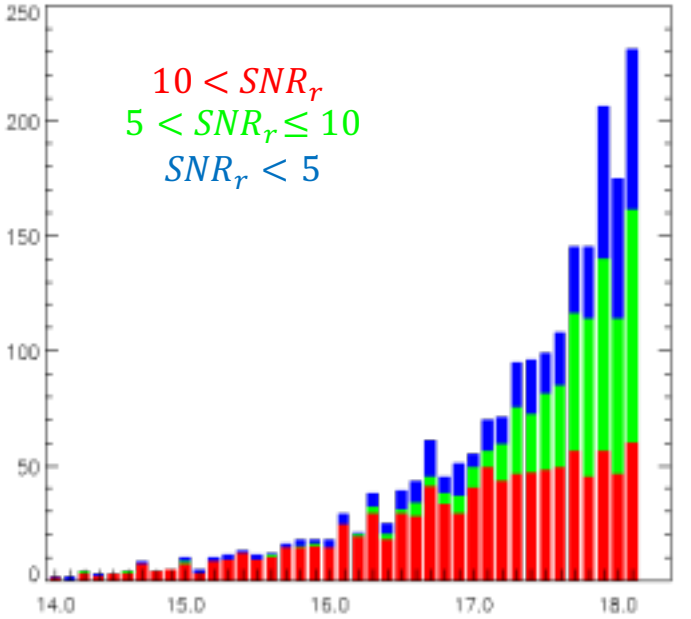
TELESCOPE PERFORMANCE

- Target loss rate:~ 17% (bright star, bad fiber, guide CCD masking, over-density)
- Efficiency: 1% for blue band and 2% for red band, dominated by the dome seeing



- The 50% complete magnitude: the percentage of galaxies with $SNR_r > 10$ is $\leq 50\%$ at ~ 17.7 mag in r-band





SCIENCE RESULTS

- Spectral pro-processing for 1D spectrum (remove sky residuals)
- The spectroscopic redshift catalog (Yang et al., in progress)
- The cluster of galaxies (a case study: Zw721; Yang et al., in progress)
- Newly discovered 64 LIRGs in LCSSPA Field A, cross-matched with ALLWISE catalog (Lam et al. 2015)
- 82 u-band variables have been identified in LCSSPA fields based on SCUSS & SDSS (Cao et al., submitted)