

Forecasts for a mm sky survey of the Northern Hemisphere with a 13m antenna



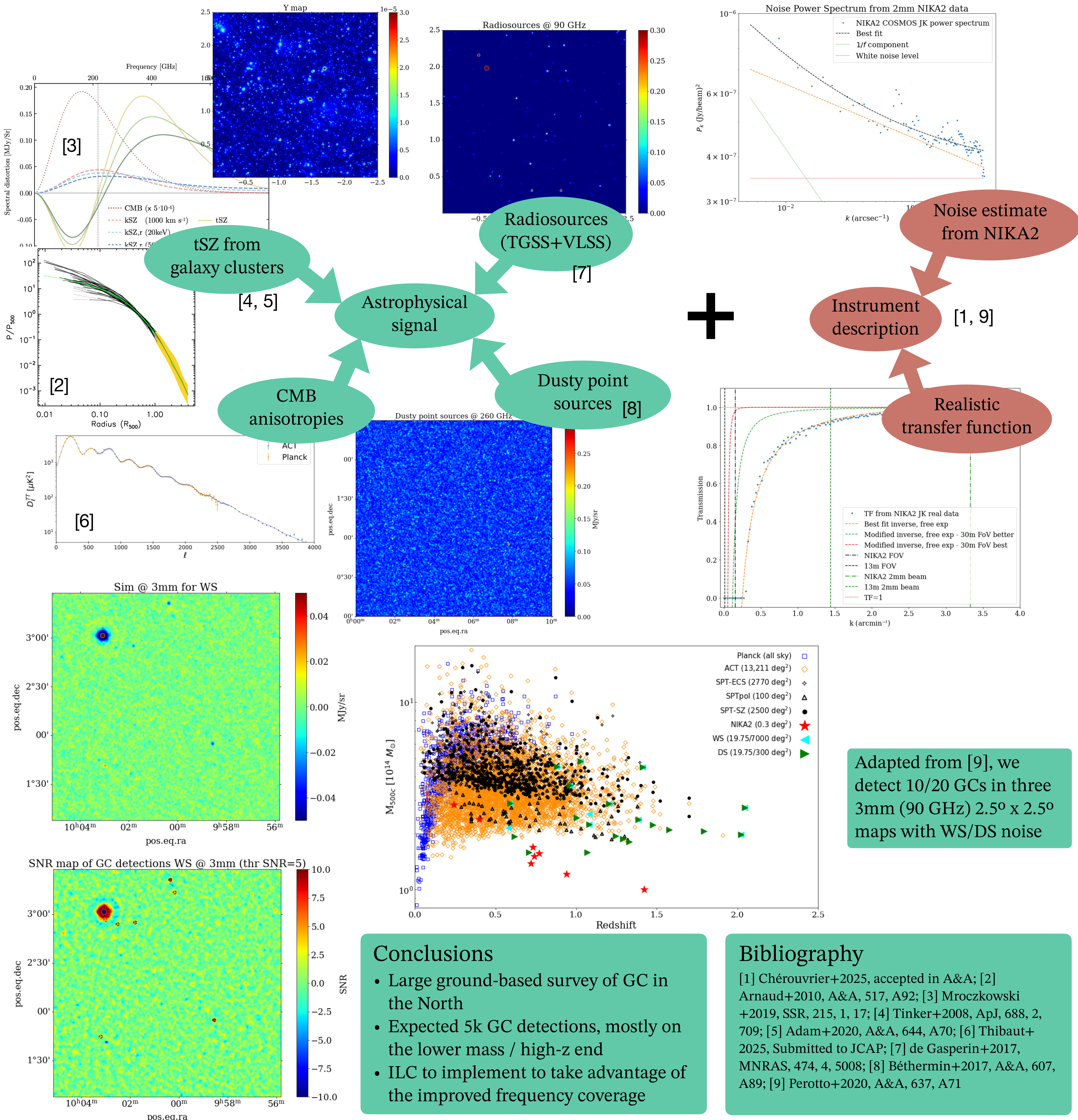
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- We propose to deploy a KIDs instrument similar to NIKA2 in a 13m antenna, observing at four mm bands: 90, 150, 220 and 260 GHz (3/2/1.4/1.2 mm). Two different surveys would be run, each with 1.5 years integration time:
 - A wide survey (WS), for a region of 7000 deg² (~1.9 h deg⁻²)
 - A deep survey (DS), observing a region of 300 deg² (~44 h deg⁻²)
- The FoV would increase from 6.5 (NIKA2) to 60 arcmin, which implies a N_{det} increase by a factor 16.
- The NEFD of the actual detectors (the KIDs) would be also improved by a factor 3.
- Both improvements would imply a decrease in the white and 1/f noise levels by factors 0.2 (WS) and 5 (DS)
- We have generated realistic simulations of how the sky would look after these improvements, and estimate its expected performance regarding the blind detection of galaxy clusters (similar to the work of [1] with NIKA2).



Conclusions

- Large ground-based survey of GC in the North
- Expected 5k GC detections, mostly on the lower mass / high-z end
- ILC to implement to take advantage of the improved frequency coverage

Bibliography

- [1] Chéroutier+2025, accepted in A&A; [2] Arnaud+2010, A&A, 517, A92; [3] Mroczkowski+2019, SSR, 215, 1, 17; [4] Tinker+2008, ApJ, 688, 2, 709; [5] Adam+2020, A&A, 644, A70; [6] Thibaut+2025, Submitted to JCAP; [7] de Gasperin+2017, MNRAS, 474, 4, 5008; [8] Béthermin+2017, A&A, 607, A89; [9] Perotto+2020, A&A, 637, A71