

Submillimeter Interferometers: New standards for future instrumentation

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The current state of the art, as represented by the systems being developed for ALMA, will first be reviewed. This includes extensive use of composite materials on the antennas, dual-polarization SIS heterodyne receivers, photonic LO reference systems, 8GHz IF bandwidth transmitted digitally on optical fibers, and a digital correlator based on ASIC's.

Various likely lines of development for future Submillimeter Interferometers will then be discussed in outline. For antennas, greater use of active control can be expected. Receiver systems providing greater bandwidth and multiple beams are becoming possible, as are direct photonic LO systems and cost- and power-effective correlators based on FPGA's.

An alternative line of development would be based on the extending infra-red technology to longer wavelengths – e.g. using quasi-optical delay lines and direct detection. The question of whether this approach may be advantageous for some astronomical applications will be considered.