

Optimization of HEB mixer for the Herschel Space Observatory.

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A mixer development for the HIFI instrument of the Herschel Space Observatory has come to the final stage. In our paper and conference presentation we will describe the most important details of the Band 6 Low and High Mixer Unit design. Special attention will be given to the optimization of the hot- electron bolometer mixer chip, which is based on 3.5nm NbN superconducting film on silicon. As the HEB's local oscillator power requirements depend on the bolometer size, we have compared mixer noise temperature for different bolometer width- to- length ratio. A trade- off between mixer performance and local oscillator power requirements results in the mixer units equipped with optimized mixer chips, providing the largest coverage of the Band6 RF band with the lowest possible receiver noise. A short account of the beam pattern measurements of Band6 mixers will be given as well.