P5B

Limits of image rejection of sideband-separating mixers

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***Abstract*—Nowadays many groups are working on sideband-separating mixers. The ALMA receivers e.g. will be equipped with 2SB mixers for band 3 to 8. And Band 9 is also working on a sideband-separating version. Initially the specification for the image rejection of the ALMA receivers was set to –10 dB. But since all groups had difficulties in achieving these values for all produced mixers, the specification had to be relaxed. It still seems to be difficult to explain, why it is a problem to achieve good image rejections with 2SB mixers. Simply summing up gain and phase imbalances of the different components and calculating the image rejection almost always results in better values than finally achieved in real mixers.**

We will examine in detail the influence of each component of the 2SB mixer on the achieved image rejection for the case of our ALMA Band 7 mixer. The measured results will be compared to theoretically derived values.