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Interactive comment on "Using nutation-frequency-selective pulses to reduce radio-frequency field inhomogeneity in solid-state NMR" *by* Kathrin Aebischer et al.

Anonymous Referee #1

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The manuscript presents an rf-amplitude-selective inversion method in the spin-lock rotating frame. This method enables spin inversion of an selective area in the sample experiencing a narrow-band of B1 (inhomogeneous) rf field. After the Introduction, the Theory of the B1 selectivity is presented and demonstrated for I-BURP 2 inversion in Fig. 1. To assist the reader, it would have been helpful to add to Fig 1a "the doubly rotating frame", to 1c and 1d-e "the spin lock rotating frame". I understand that in Eq. 2 phi(t) does not contain the counter-rotator terms and therefore what is the meaning of "Therefore" on line 51. Eq. 3 assumes that w0-wfr=0. Numerical results show the inversion selectivity and indicates the correlation between the length of the inversion pulse and the band selectivity. Experiment-1 demonstrates the inversion <Ix> to <-Ix>

beautifully via a nutation experiment around a y-spin lock field. Experiment-2 repeats this experiment on glycine instead of on adamanate. The results are compare with a standard spin-lock preparation. Unfortunately, the color coding of the results shown in Fig 5 are not sufficient to appreciate the success of the experiments. The "blue" curve doesn't have an oscillating frequency dependence, but is rather composed of many profiles. Furthermore, the "red" lines are indistinguishable. Experiment-3 presents an implementation of the selective inversion method. FSLG decoupled spectra of L-histidine show very nicely all expected effects; line narrowing and line intensity loss. Overall I thus recommend publication with some minor modification.

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