
Matched filtering for EASIER data 2

Abstract 4

We introduce in this note the method of matched filtering to EASIER data.

1 Introduction **6**

The IPN software is inherited from a Karlsruhe software that was adapted by Francesco for EASIER and then modified by Olivier and Imen to introduce their way to compute the MBR signal. We aim at giving an overview of the functioning of the software here. 8

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2 Checks

Here we compare the results we obtain with others.

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2.1 Gorham shower

Gorham shower, or the reference shower is a vertical, $3.36 \cdot 10^{17}$ eV shower, observed at 10 km. 14
The flux originally calculated in [1] is $F_{\text{ref}} = 2.77 \cdot 10^{-24} \text{ W.m}^{-2}.\text{Hz}^{-1}$.

We simulate the reference shower and record the flux at several distances. The results are 16
given in figure ???. We have set the units the same way than in in [2].

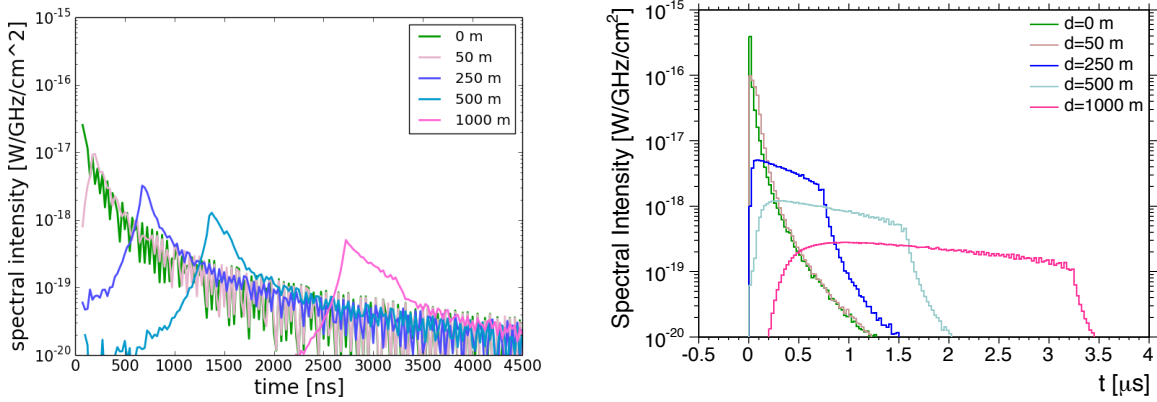


Figure 1 three example of simulated trace with on top of each figure the signal in ADC counts, and on the bottom the signal in sigma

References

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- [1] P. Gorham, N. Lehtinen, G. Varner, J. Beatty, A. Connolly, et al., *Observations of Microwave Continuum Emission from Air Shower Plasmas*, Phys.Rev. **D78** (2008) 032007, [arXiv:0705.2589](#) [astro-ph]. 20
- [2] I. Al Samarai, C. B  rat, O. Deligny, A. Letessier-Selvon, F. Montanet, M. Settimo, and P. Stassi, *Molecular Bremsstrahlung Radiation at GHz Frequencies in Air*, Phys. Rev. **D93** (2016) no. 5, 052004, [arXiv:1601.00551](#) [astro-ph.IM]. 22 24