Improving dark matter direct detection analysis

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Speed dependence

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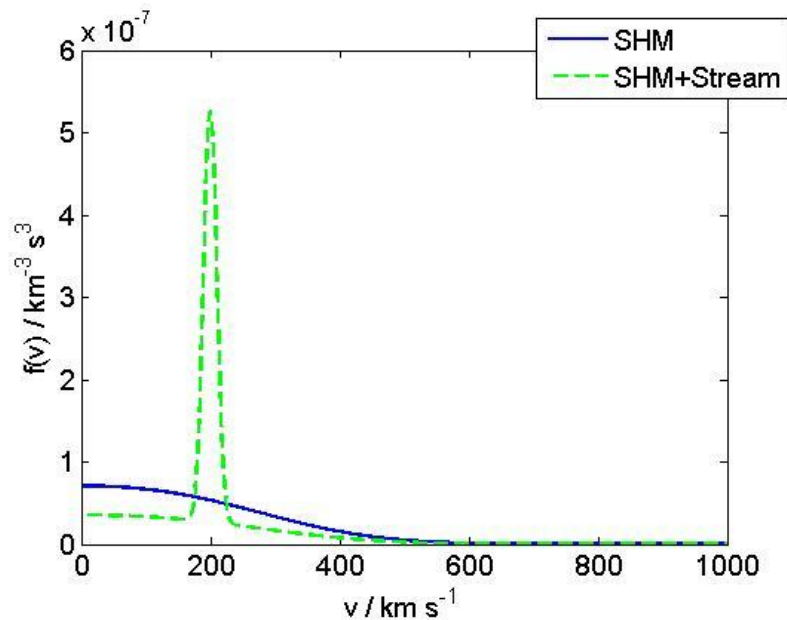$$v_{\min} = \sqrt{\frac{m_N E_R}{2\mu_{\chi N}^2}}$$

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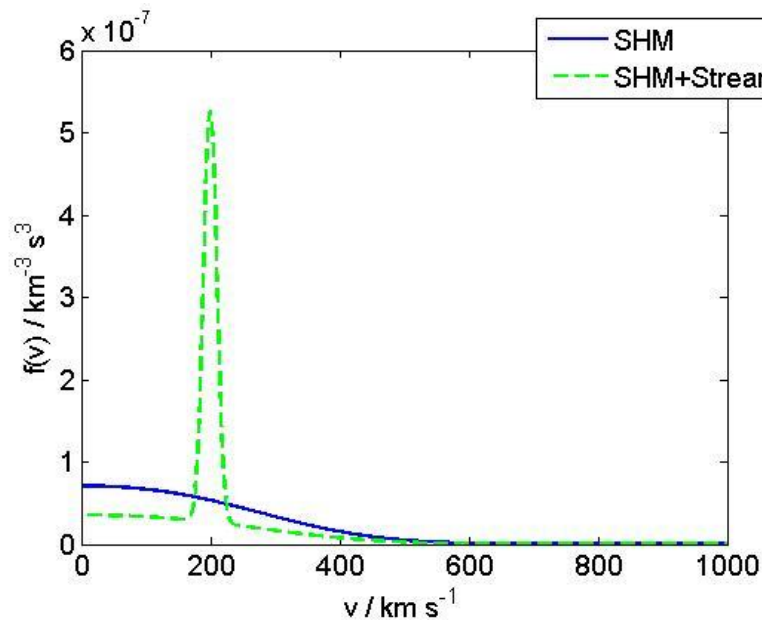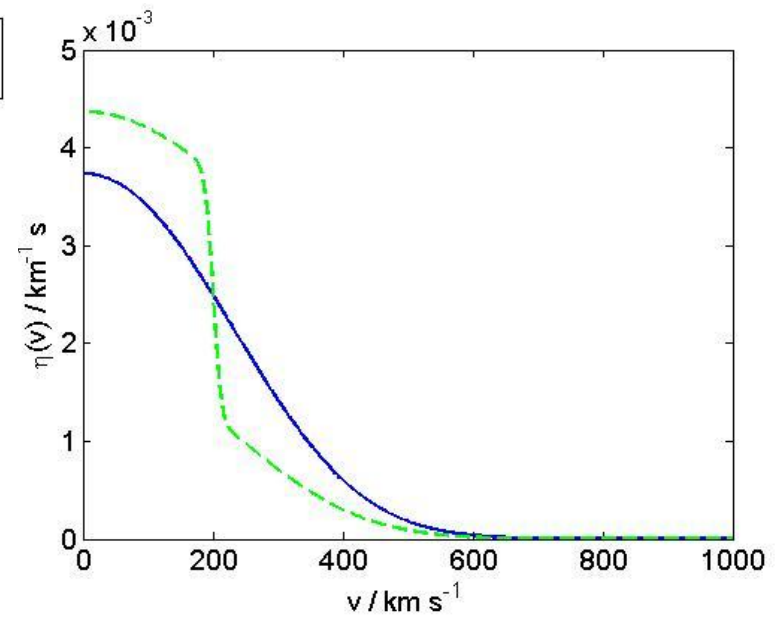

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Speed parametrisation method

A. H. G. Peter – arXiv:0910.4765, arXiv:1103.5145

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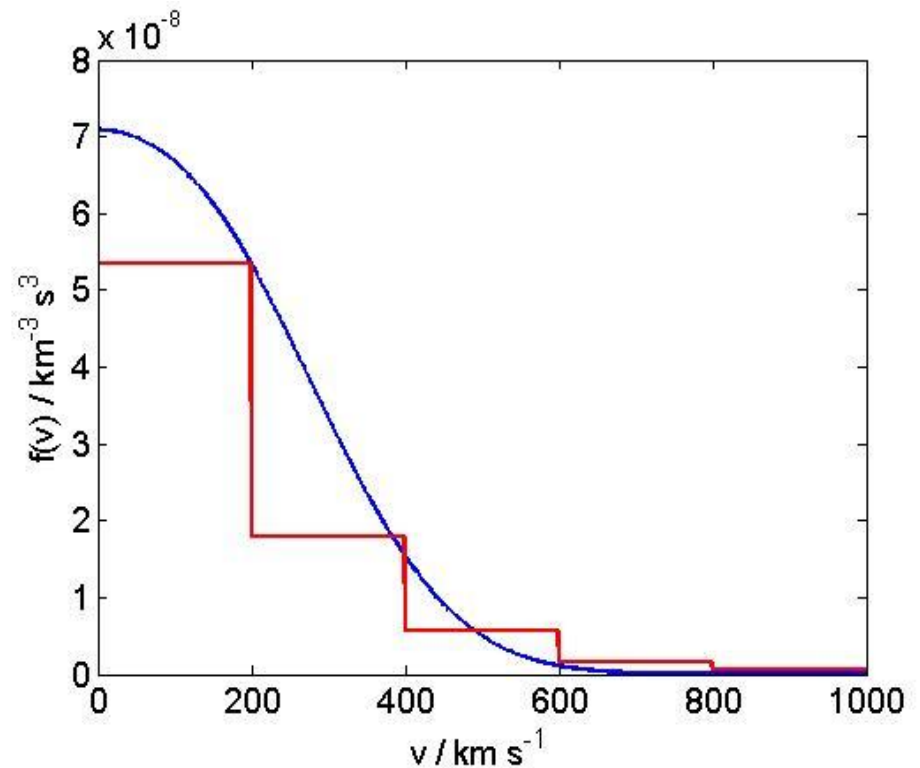A. H. G. Peter – arXiv:0910.4765, arXiv:1103.5145

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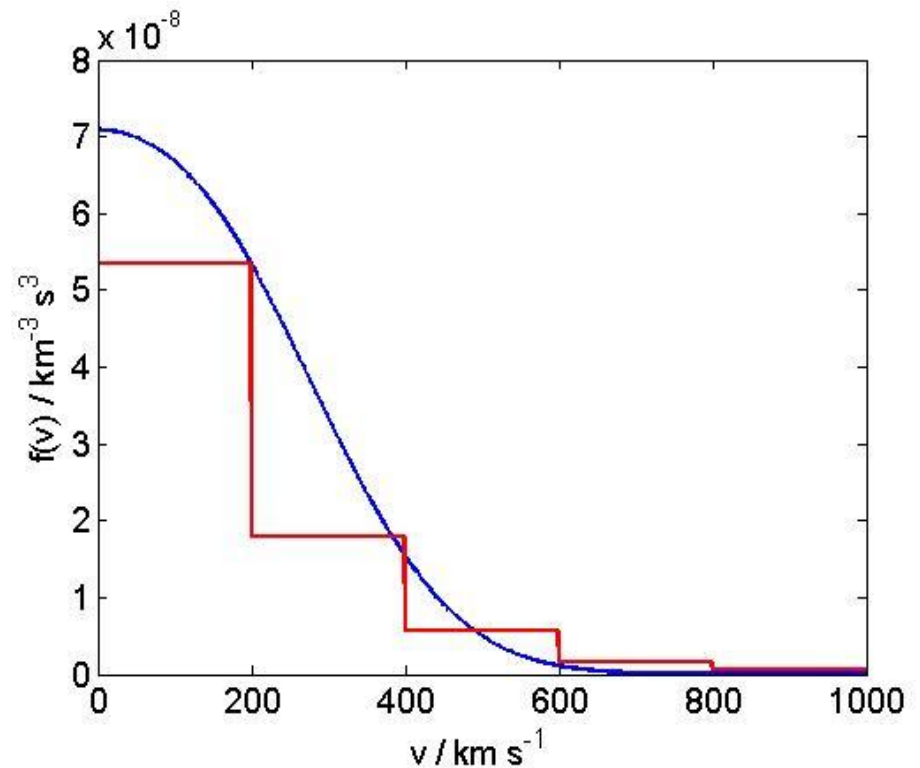
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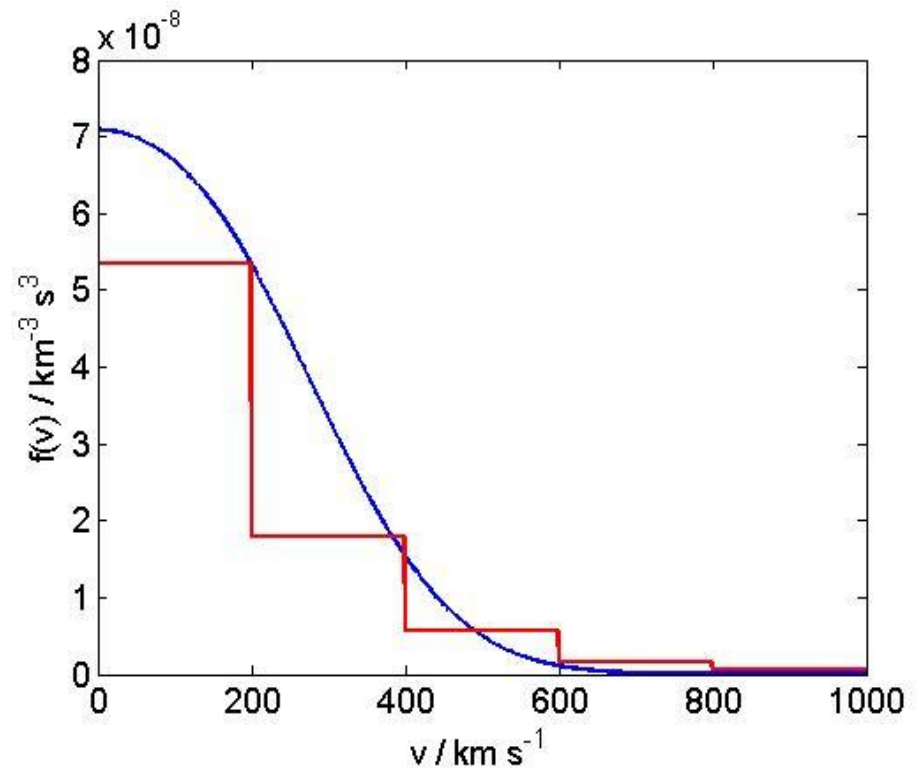A. H. G. Peter – arXiv:0910.4765, arXiv:1103.5145

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- Unfortunately – IT DOESN'T WORK!
- Still leads to a bias in the reconstructed mass and cross-section
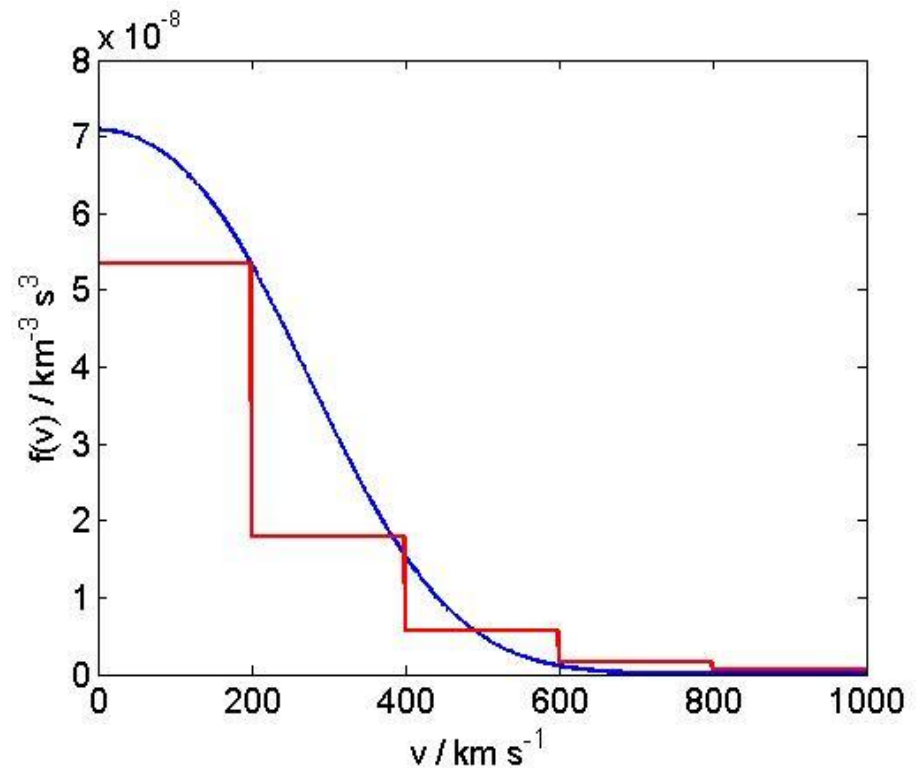
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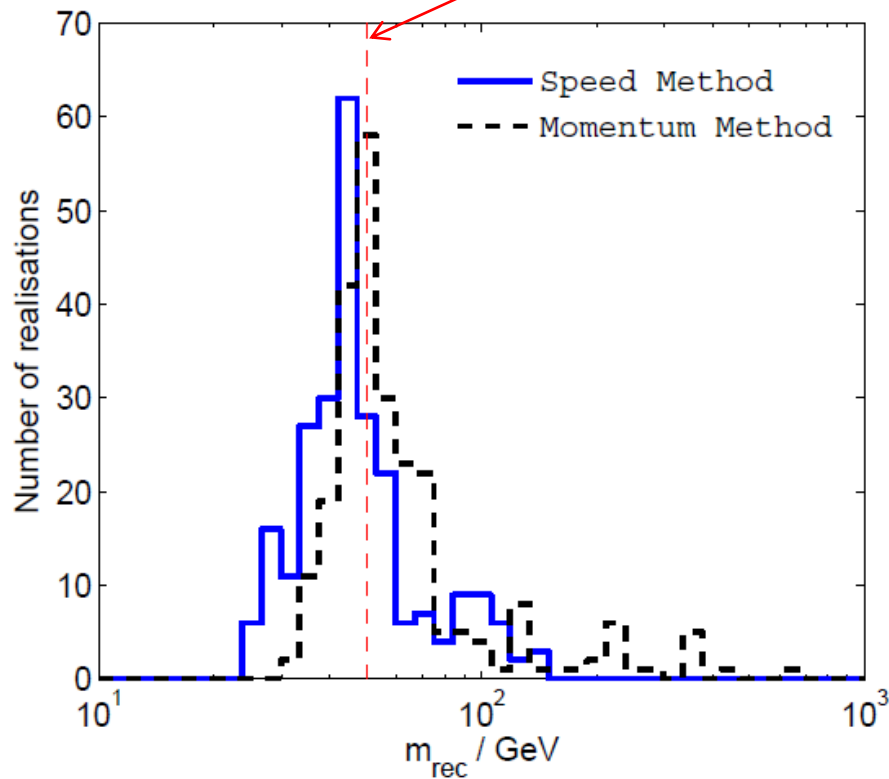
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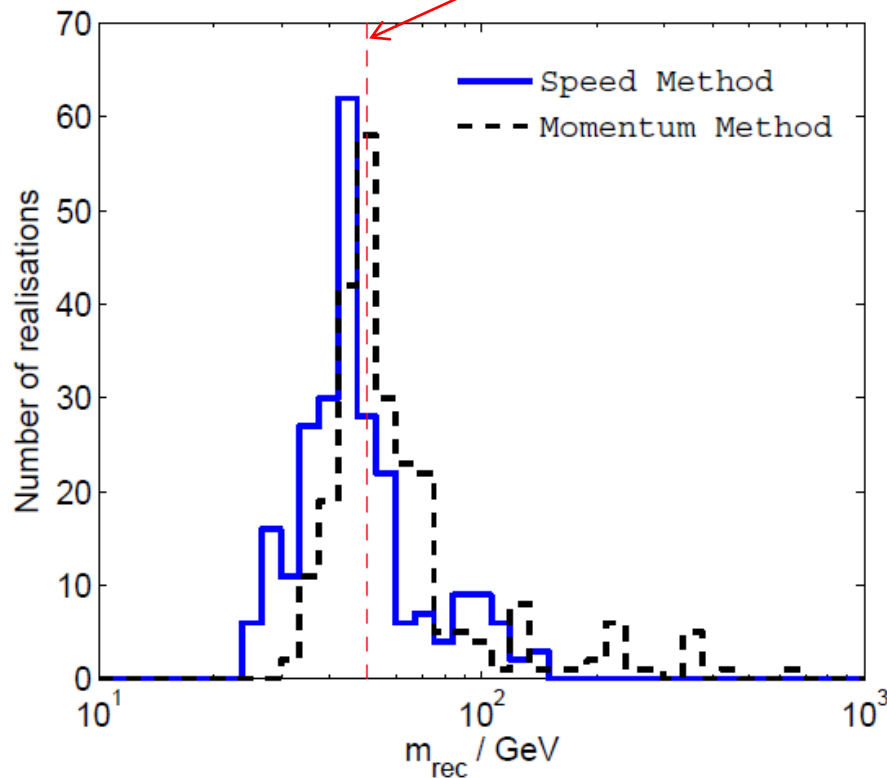

SHM

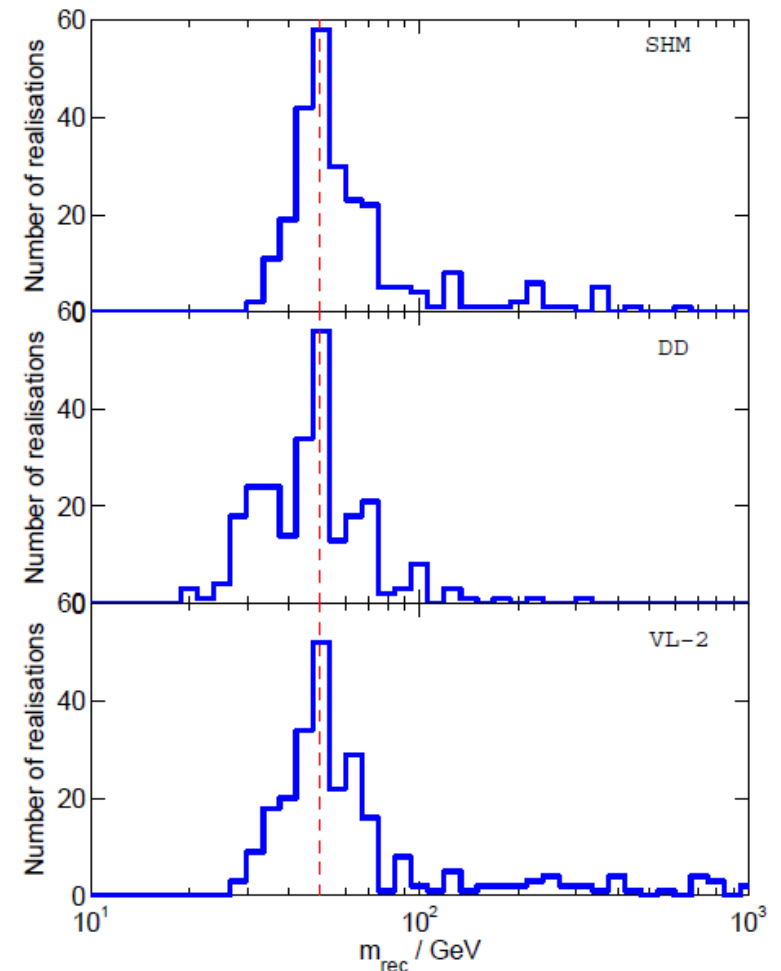# Momentum parametrisation

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50 GeV benchmark

SHM

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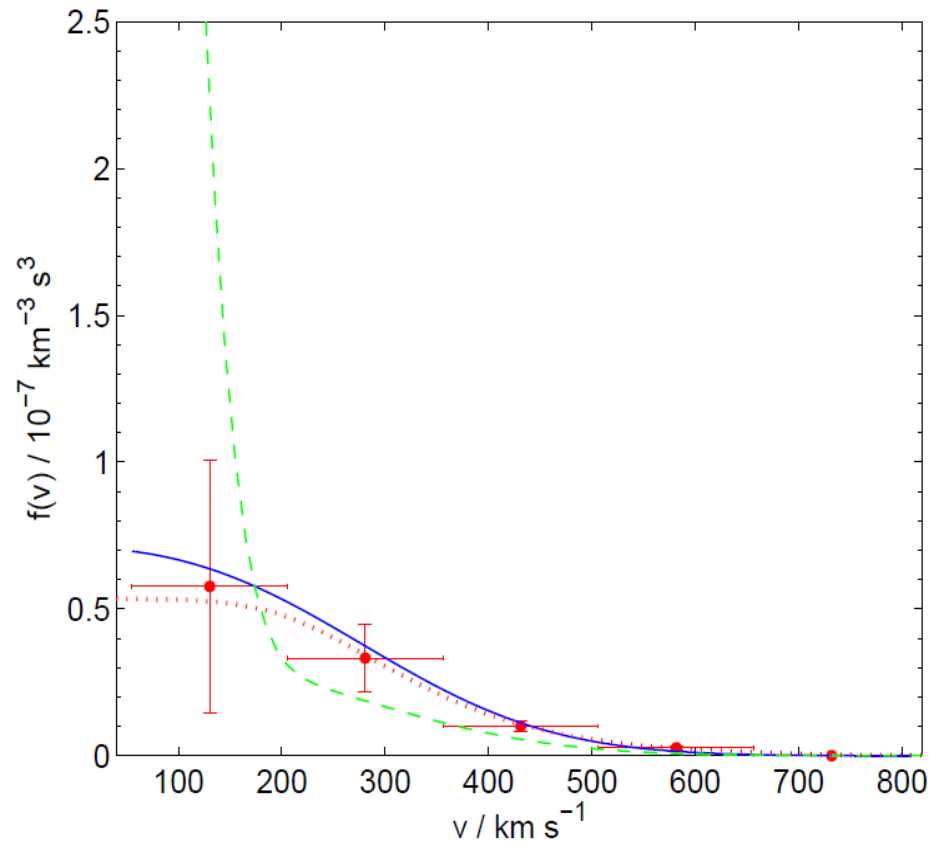- Reconstructing f(v) is complicated (errors strongly correlated)

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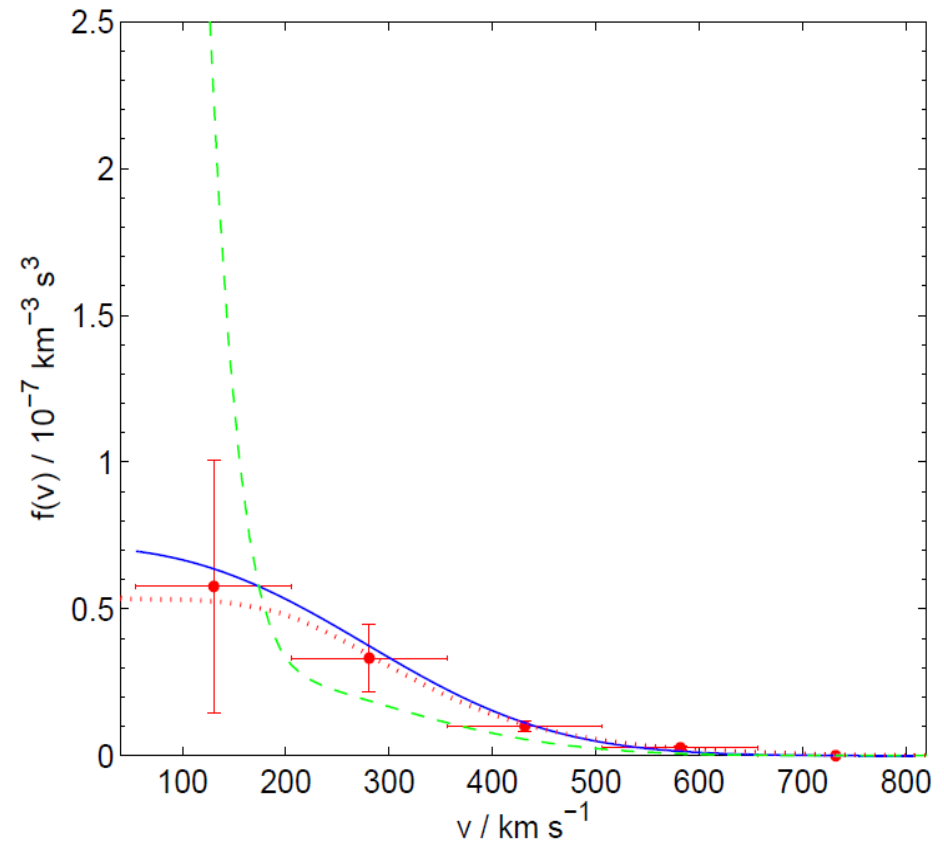
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- Future – extending to directional detectors which give full 3D information about f(**v**)

Thanks for listening