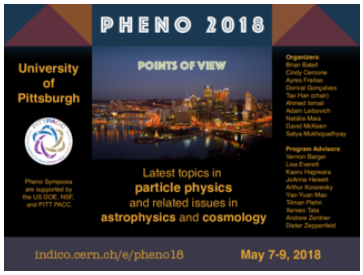


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# Measuring the mass, width, and couplings of semi-invisible resonances with the matrix element method

*Monday 7 May 2018 15:00 (15 minutes)*

We demonstrate the use of the Matrix Element Method (MEM) for the measurement of masses, widths, and couplings in the case of single or pair-production of semi-invisibly decaying resonances. For definiteness, we consider the two-body decay of a generic resonance to a visible particle from the Standard Model (SM), and a massive invisible particle. It is well known that the mass difference can be extracted from the endpoint of a transverse kinematic variable like the transverse mass, $M_T$ , or the Cambridge $M_{T2}$ variable, but measuring the overall mass scale is a very difficult problem. We show that the MEM can be used to obtain not only the absolute mass scale, but also the width of the resonance and the tensor structure of its couplings. Apart from new physics searches, our results can be readily applied to the case of SM W-boson production at the CERN Large Hadron Collider (LHC), where one can repeat the measurements of the W properties in a more general and model-independent setup.

## Summary

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