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Spectral Line Shapes: a Paradigm Shift

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As in Can. J. Phys. vol. 91, 879-895 (2013), the impact theory of spectral line shapes is summarized and a problem identified if one wishes to compare theory with experimental results. The theory predicts only spectral profiles, i.e. the width and shift of lines cannot be calculated directly. The problem is, there are no known analytical solutions to the theory. While the way out of this difficulty is evident, viz. numerical calculations, such an approach would, nevertheless, represent a significant paradigm shift for the field. It could also open up new avenues of research in spectral line shapes.

Author: Dr MAY, A. D. (University of Toronto)

Co-authors: Dr SHAPIRO, D. (I.A.E. Novosibirsk); Dr MCCOURT, F.R.W. (University of Waterloo); Dr SANCHEZ-FORTUN STOKER, J. (University of Regina); Dr CIURYLO, R. (Nicolas Copernicus University); Dr WEHR, R. (University of Arizona); Dr LIU, W.-K. (University of Waterloo)

Presenter: Dr MAY, A. D. (University of Toronto)

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