

## Robert Bennett

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**Tuesday, 21<sup>st</sup> January 2020, 16:00 s.t.**

TU Wien, Institut für Angewandte Physik, E134  
1040 Wien, Wiedner Hauptstraße 8-10  
Yellow Tower „B“, 5<sup>th</sup> floor, SEM.R. DB gelb 05 B



### **The virtual photon model for interatomic Coulombic decay: solvents, surfaces and the far-field**

Multi-centre decay processes such as interatomic Coulombic decay (ICD) or resonant energy transfer (RET) are usually described through ab initio electron dynamics. While such methods are very powerful, they are based on instantaneous electron-electron interactions and therefore do not take into account the phase evolution of signals from one place to another. This is usually a good assumption due to the small distances involved, but becomes less reasonable as distances are increased. Methods based on dipole-dipole coupling in quantum electrodynamics can fully describe the smooth transition from near- to far-field behaviour, as well as take into account the dielectric response of a background medium which can be inhomogeneous. In this talk I will outline how the virtual photon model works, and discuss the limits of its applicability. Finally I will give some examples of its use in past and current projects, in particular in the context of highly-charged ions and the search for candidate systems amenable to the observation of far-field behaviour.

**Dr. Bennett** is a Alexander von Humboldt Fellow at the Albert-Ludwigs-Universität Freiburg in Germany. Since 2015 he is working in the Quantum Optics and Statistics Group of Stefan Buhmann and Andreas Buchleitner. Dr. Bennett received his PhD in 2013 from the University of Sussex and held a PostDoc position from 2013-2015 at the University of Leeds.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion).

Friedrich Aumayr  
(LVA-Leiter)

Richard Wilhelm  
(Seminar Chair)