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Abstract for an Invited Paper
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New attosecond spectroscopies for correlation-induced electron hole dynamics¹

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In this talk I will present two of our recent ideas for new attosecond time-resolved measurements of electron hole dynamics [1,2]:

- *Single-photon* laser enabled Auger decay (*spLEAD*) spectroscopy

and

- High-harmonic generation (HHG) spectroscopy of Auger-type transitions.

Unlike the well-known attosecond streaking, the proposed spectroscopies do not rely on photo- or secondary electron emission and are applicable to ultrafast electronic processes involving bound-bound transitions, such as electron correlation-driven charge migration. We simulate the new attosecond spectroscopies using both model and *ab initio* methods. Specific applications include hole migration in glycine, atomic Auger and Coster-Kronig decays as well as quasi-exponential dynamics of molecular orbital breakdown in *trans*-butadiene and propanal.

[1] B. Cooper and V. Averbukh, *Phys. Rev. Lett.* **111**, 083004 (2013).

[2] J. Leeuwenburgh, B. Cooper, V. Averbukh, J. P. Marangos and M. Ivanov, *Phys. Rev. Lett.* **111**, 123002 (2013).

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