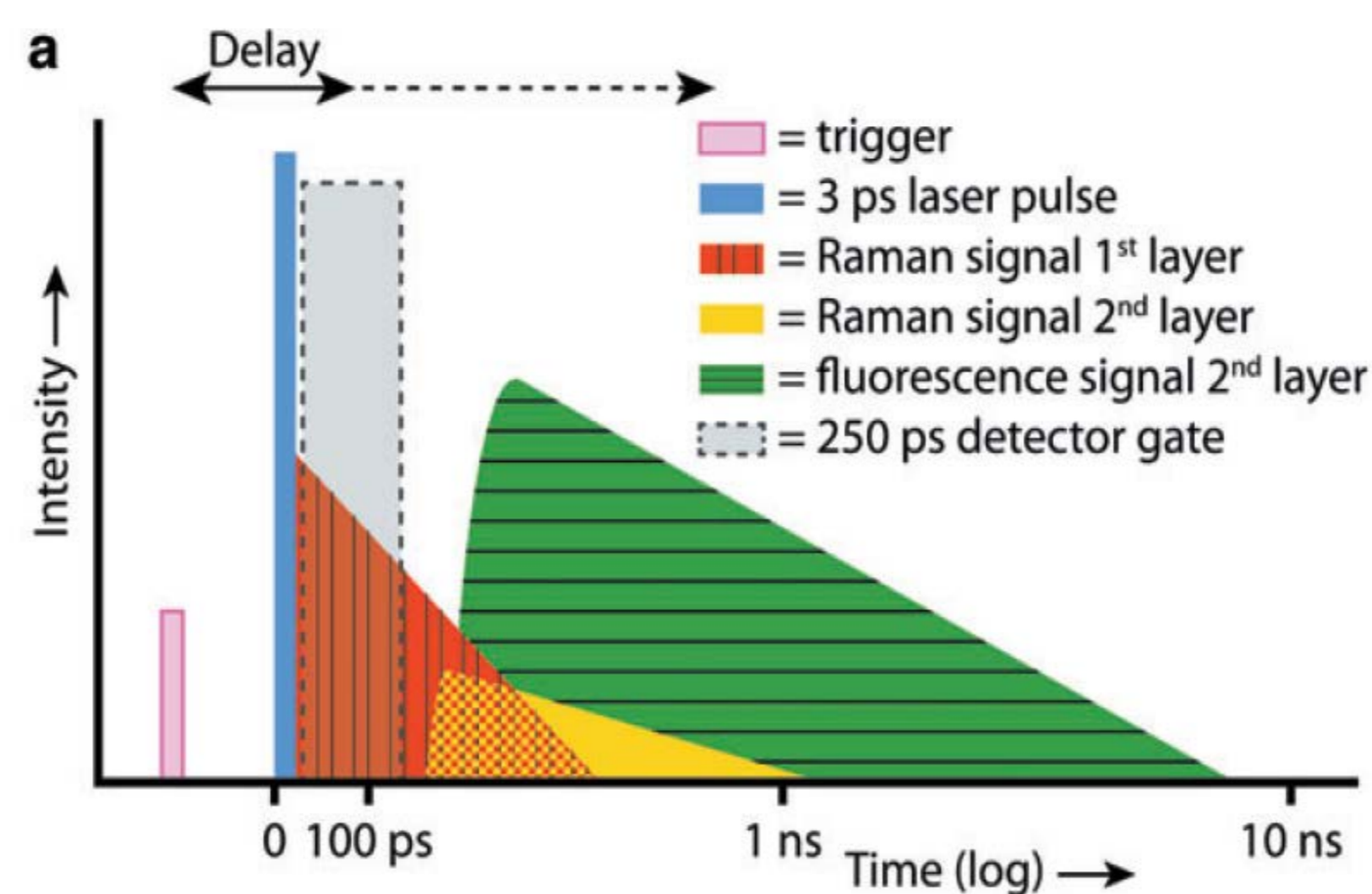


Depth analysis of non-transparent samples using time-resolved Raman spectroscopy

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Raman spectroscopy offers a high degree of molecular specificity for non-invasive sample characterization, including tissue diagnosis, forensics, and in the near future even planetary exploration. First, some basics of the method and examples of conventional Raman and resonance Raman applications will be discussed. However, in the case of non-transparent samples, classical focusing into deeper layers is not possible due to the scattering nature of the material. In such cases, Raman spectra of the subsurface can still be obtained using Time Resolved Raman Spectroscopy (TRRS). Our approach is based on picosecond laser excitation and a fast gated intensified CCD camera. By optimizing the detector delay in a backscatter geometry, one can achieve selectivity for deeper layers over the normally much stronger signals from the surface. In addition, the time-gated detector helps to suppress background fluorescence. Several recent applications of TRRS will be discussed, including a study on how to detect hidden bacteria through rocks when searching for traces of Life on Mars.



Scheme of time-resolved Raman detection, using short (3 ps) laser pulses and gated detection. By changing the delay one can obtain extra selectivity for Raman signals originating at certain depths, and also suppress the unwanted fluorescence background.

Date: 3:30 p.m., Tuesday 14th February 2017

Location: Lecture Hall (Hörsaal) O'019,
 Erwin Schrödinger Zentrum, Rudower Chaussee 26, 12489 Berlin

All guests are warmly invited to attend!