TIME-DOMAIN INTERFEROMETRY FOR DYNAMICS STUDY

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Inelastic/quasi-elastic scattering methods allow us to measure the microscopic dynamics of condensed matter systems in various time and spatial scales as shown in Fig. 1. Quasi-elastic scattering experiments using Mössbauer gamma-rays from RI sources have been performed soon after the discovery of the Mössbauer effect in 1960s [1,2]. However, because gamma rays from RI sources do not have enough brilliance as a parallel beam required for quasi-elastic scattering experiments, the method requires much measuring time.

Synchrotron-radiation (SR)-based quasi-elastic scattering experiment has been attempted using Mössbauer gamma rays from ^{57}Fe-nuclear Bragg monochromator [3,4]. Additionally, SR-based gamma-ray time-domain interferometry (TDI) has been used for quasi-elastic scattering experiments. [5-8] It has been demonstrated that SR-based experiment allows for much quicker measurement. In the presentation, we talk the quasi-elastic scattering technique using TDI which covers unique time and spatial scales as shown in Fig. 1.

References

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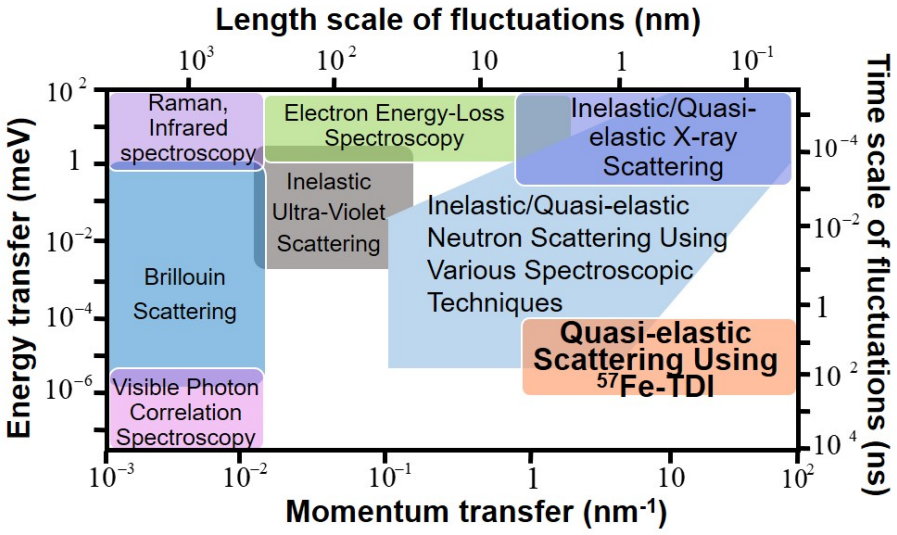

Fig. 1 Time and spatial scales of fluctuations studied by various inelastic/quasi-elastic scattering systems.