New Ideas in Time-domain Interferometry

F. Caporaletti[1], S. Capaccioli[2], S. Valenti[3], A. I. Chumakov[4], M. Mikolasek[4] & G. Monaco[5]

[1]Van der Waals-Zeeman Institute, Institute of Physics/Van 't Hoff Institute for Molecular Sciences, University of Amsterdam, Amsterdam, The Netherlands

[2]Dipartimento di Fisica, University of Pisa, Pisa, Italy

[3] Department of Physics, Universitat Politècnica de Catalunya, Barcelona, Spain.

[4] ESRF-The European Synchrotron, Grenoble, France

[5] Dipartimento di Fisica ed Astronomia, Università di Padova, Padova, Italy

Nuclear γ-resonance time-domain interferometry (TDI) provides access to atomic and molecular motions at the Ångstrom length-scale and in the ns-us time-window [1,2,3]. It is therefore the perfect tool to take a microscopic look at relaxation processes in supercooled liquids in that time window, and in the recent years has significantly contributed to the understanding of the glass-transition and of the associated atomic motions [4,5,6,7].

In this talk the state-of-the-art of TDI will be discussed [2,3,8] along with the new challenges and future perspectives, with a focus on the study of the glass-transition.

In particular the new opportunities open by the combination of multi-line TDI experiment [2,3,8] and dielectric spectroscopy measurements [6,7] will be explored. Such approach, being able to access both re-orientational and translational motions and to also determine the fraction of molecules involved in a relaxation process [7], has the potentiality to open a new window on the unique space-temporal properties of supercooled liquids and glasses.

References

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