

# Dynamical correlations in simple disorder and complex disorder liquids

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Liquids are disordered and they come in two variants [1]: simple disorder, such as Lennard-Jones liquids, CCL<sub>4</sub>, or weakly polar liquids such as acetone, and complex disorder, such as water, alcohols, hydrogen bonding liquids, or soft-matter and biological liquids. The second variant differs from the first in the intriguing duality between concentration fluctuations and clustering [2]. In Ref.[1] we described this difference using statistical quantities such as atom-atom pair correlation functions, in particular the pre-peak feature [3]. In this presentation, we extend this study to dynamical atom-atom van Hove correlation functions and the associated memory functions, as obtained from molecular dynamics simulations. Interestingly, dynamical complexity is characterized by the difference between real time and kinetic time, the latter which is an emerged quantity, just as clusters are, due to the fact that associated entities appear as supra-particles, distinct from the real molecules in the system. The analysis highlights many new properties of dynamical correlations in molecular liquids.

## REFERENCES

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