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An Instrument-Concept for Dynamics of Complex (Bio-) System from Elastic Scattering

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We have devised an instrument to measure purely elastic-scattering over a wide range of energy-resolutions as efficiently as possible. Its clientele would be those who wish to study the dynamics of complex biological systems where the inelastic and quasi-elastic signals are too intractable.
Nevertheless, the overall timescales of dynamical transitions can be obtained from inflection(s) in the plot of elastic-intensity against energy-resolution. This is the energy-analogue of the well-known temperature-scan (or fixed-window scan) in which the dynamics of the system is driven through the fixed elastic-resolution of an instrument by ramping the sample-temperature.
We will discuss how a backscattering approach can be used, but in which the energy-width of the incident beam can be tailored to scan the resolution over a wide range. In addition to simplicity and improved efficiency, there is the potential to focus on small samples (~1mm3), which is a considerable advantage for biological materials usually available in limited quantities.
This instrumental-concept can be used on continuous or pulsed neutron sources. Numerical simulations of the basic design have been successfully done by McStas, so that technical details and performance are presented in details.

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