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## Current Developments of the Dynamic Transmission Electron Microscope

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Dynamic transmission electron microscopes (DTEMs) are a special class of high-speed imaging systems that are uniquely capable of studying the physio-chemical evolution of nanomaterials. In contrast to the stroboscopic pump-probe acquisition of ultrafast transmission electron microscopes, a DTEM is designed to capture a snapshot image of a transient irreversible event with nanosecond time resolution, allowing for the study of the early stages of phase transformations and chemical reactions. The DTEM at INRS-EMT is also fitted with a deflector plate system which enables a movie-mode operation to capture multiple images such an event with a maximum framerate of 50 MHz. In this talk I will introduce the design and capabilities of this microscope as well as survey recent results. Notably, I will present how we have used compressed sensing tomographic imaging to push its time resolution into the picosecond regime. Then, I will discuss ongoing in situ studies of pulsed laser annealing of hafnium-zirconium oxide and photoreduction of graphene oxide.

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