

Motional relativity and novel NMR sensors

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Some of the exciting implications of both translational and rotational motional relativity in NMR will be discussed. Translational relativity is being exploited in the development of novel sensors for imaging objects travelling at high speed (several m/s) on industrial conveyors. Results for one-dimensional profile images will be presented and the possible extension to fast on-line 2-dimensional imaging will be discussed. Rotational relativity can be exploited in the development of a novel open-access NMR field-cycling sensor and the possibility of exploiting rotational relativity in the development of "RF-free" NMR will be discussed. The "open-access" nature of Halbach NMR will be emphasised as it opens up new possibilities for sensor fusion with other spectroscopic methods, for NMR-rheology and for high pressure/temperature studies.