Saturation of Ozawa's bound with flying qubits and interferometry

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The WAY (Wigner-Araki-Yanase) theorem and its generalizations pose bounds on the accuracy and repeatability of quantum measurements.

In this seminar, I will present the WAY theorem and the bounds derived by Ozawa and Loveridge/Busch. Then, I will present a simple interferometric setup in which these two bounds can be saturated. In the regime where this saturation is achieved, this shows that the bounds are strict. Interestingly, this saturation necessitates the use of Gaussian wave packets, because they are of minimum uncertainty. Finally, I will briefly talk about how to study the proposed setup with arbitrary pointer observables.