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Clash of the quantum clouds measured for first time

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FOR the first time, physicists have measured interactions between two exotic clouds of atoms known as Bose-Einstein condensates (BECs) without completely destroying the clouds.

BECs form when a gas is chilled to a few billionths of a degree above absolute zero. The atoms in the gas settle into a single quantum state and behave as one quantum mechanical wave. Each such wave has a phase and if two of these waves interact, their phase difference should produce an interference pattern. But previous attempts to produce this pattern have ruined the clouds.

Now Michele Saba's team at the Massachusetts Institute of Technology in Cambridge has measured the difference in phase of two BECs without destroying them. They used yellow laser light to nudge out a stream of atoms from each cloud and make them interfere. This allowed them to measure the phase difference between the two clouds and follow its evolution over time. The clouds would eventually run out of atoms (*Science*, vol 307, p 1945).

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