Tracking Flow with Smart Dust

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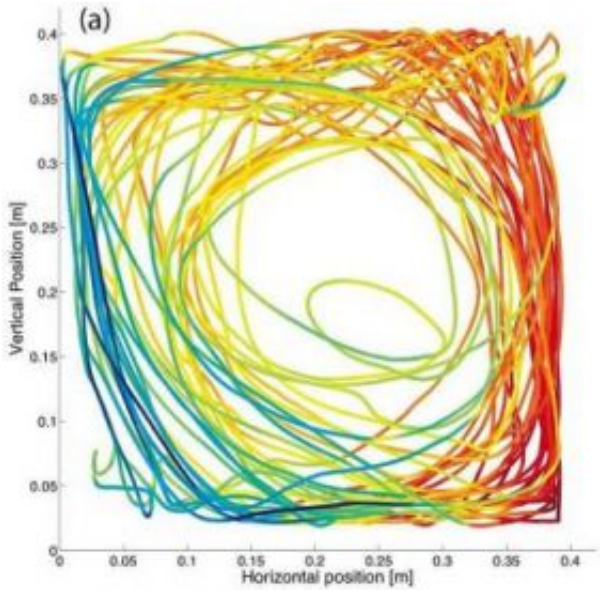

The path of a smart particle is color-coded to indicate the temperatures it wirelessly reports back during its travels. Credit: Y. Gasteuil, W.L. Shew, M. Gibert, F. Chill'a, B. Castaing and J.-F. Pinton

Tiny probes packed with instrumentation have been turned loose in a laboratory in France.

The marble-sized devices are an important step on the road to long-anticipated miniaturized machines known as smart dust (picture the artificial swarm in Michael Creighton's "Prey," only without the bloodlust). The small and simple machines are being developed to be released in large numbers to collect data about the motion of fluid

systems such as ocean currents and atmospheric winds.

The two centimeter probes are on the large side for smart dust (typically, miniature machines must fill a volume of a cubic centimeter or less to make the cut), still the probes' abilities are impressive for their size. They float freely underwater, measure local temperatures down to a millionth of a degree Kelvin, and send it all back wirelessly. Previous devices used for similar measurements had to remain above water or stay in one place.

The team of physicists that made the smart particles at the Université de Lyon used them to track the paths of tiny heat packets that travel through fluids, showing that the packets follow a regular pattern. The researchers are hopeful that the device will teach them more about the motion of particles in turbulent systems, including hurricanes and mixtures of reactive chemicals.

Citation: Y. Gasteuil, W.L. Shew, M. Gibert, F. Chill'a, B. Castaing and J.-F. Pinton
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