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Light-dragging effect in a moving electromagnetically induced transparent medium[1] CHANG HUANG, PEI-CHEN KUAN, SHAU-YU LAN, Nanyang Technological University — As one of influential experiments on the development of modern physics, the phenomenon of light dragging in a moving medium has been discussed and observed extensively in different types of systems. In order to get a larger dragging effect, a long duration of light traveling in the medium is preferred. We therefore demonstrate a light-dragging experiment in an electromagnetically induced transparent cold atomic ensemble to enhance the dragging effect by at least three orders of magnitude compared with the previous experiments. With a large enhancement of the dragging effect, we realize an atom-based velocimeter that has a sensitivity two orders of magnitude higher than the velocity width of the atomic medium used. The result suggests the possibility of making a motional sensor using the collective state of atoms in a room temperature vapor cell or solid state material in the future.

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