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Michelson-Morley in Einstein's elevators FRED PIERCE, AYAL PIERCE, NVRHS — Experiments are proposed in which a Michelson-Morley interferometer is placed in Einstein's thought experiments where elevators are subjected to varied accelerated fields. Unbeknownst to the observers inside the elevators, they are placed in different circumstances: on the surface of the Earth, in free fall, in space distant from any mass, and inside a rotating space station. By use of not one, but two objects, the observer will be challenged to determine the nature and shape of the accelerated field, if any, inside the elevator. It will be demonstrated that the nature of the accelerated field can be determined easily from inside the elevator by the motion of the two objects released by the observer. It will also be shown that, for the elevator on the space station which is generating an "artificial gravity" field by rotation, Michelson-Morley would have the same null result as on Earth. However, the Michelson-Morley experiment is adapted so that in addition to the two horizontal arms of the interferometer (parallel to the floor of the elevator) a vertical arm is added perpendicular to the floor facing towards the ceiling. Such a vertical arm added to the Michelson-Morley experiment adds a new dimension to examining each accelerated field, including gravity.

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