

Bell's spaceships in free fall

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Abstract

Two small spaceships, initiated from the state of rest, fall freely in a uniform gravitational field, in a way that the direction of their separation is parallel with the field. As the spaceships are accelerated by a uniform field, they will have at every moment the same velocity, and so remain displaced one from the other by a fixed distance. Suppose that a fragile thread is tied initially between the spaceships. If it is just long enough to span the required distance initially, then as the rockets speed up, it will become too short, because of its need to Lorentz contract, and must finally break. It must break when, at a sufficiently high velocity, the prevention of the natural contraction imposes intolerable stress.

Is it really so?