

Answer on Question #65268-Physics-Other

The average velocity of a particle is zero but not its average speed. Is it possible?

Answer

Yes. It is possible if a particle travels along a circle. Its velocity changes every moment (as the velocity of particle has different orientation every moment) but average velocity is zero for each period of rotation:

$$\vec{v}_{avg} = \frac{\vec{d}}{T} = \frac{\vec{d}_f - \vec{d}_i}{T} = \frac{0}{T} = 0.$$

The magnitude of velocity (speed) has the constant nonzero value. Thus,

$$v_{avg} = v = const \neq 0.$$

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