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## Rotation of the free layer of titanium dioxide nano-fluid in an external electric field

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### Abstract

In this paper, the effect of titanium dioxide nanoparticles on the response of the freely suspended nano-fluid was investigated in an external electric field. Applying the external electric field to liquid film carrying electric current caused the layer rotation. It was due to the surface charge response of the layer to the electric field. The effect of surface charge on titanium dioxide nano-fluid rotation at various concentrations was studied. The results showed that the presence of nanoparticles in the fluid doubled the rotation velocity. Also, the effect of ultraviolet radiation on the rotation velocity of the fluid was examined, showing that there was no significant impact on rotation velocity. Finally, the needed time to reach the maximum rotation velocity of the nano-fluids layers was measured .

**Keywords:** graphene oxide, TiO<sub>2</sub> nanoparticles, liquid film

For full article, refer to the Persian section