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## Mathematical Modeling of Rotating Electro – Osmotic Flow In a Slowly Varying Mirco - Channel

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### **Abstract:**

In this work, new mathematical model and analytical solution for electro magneto-hydrodynamic rotating flow in a non-uniform micro-channel was derived. The classical model and its numerical solution of this problem here was given in the literature and is found to be a special case of the problem here presented. The analytical solution is obtained without the use of numerical finite difference method. The derived semi-analytical solution will be important for assessing the accuracy of approximate numerical and theoretical procedures, as well as experimental practices.

#### **Keywords:**

Unsteady flow; slip velocity; rotating frame; analytical solution.

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