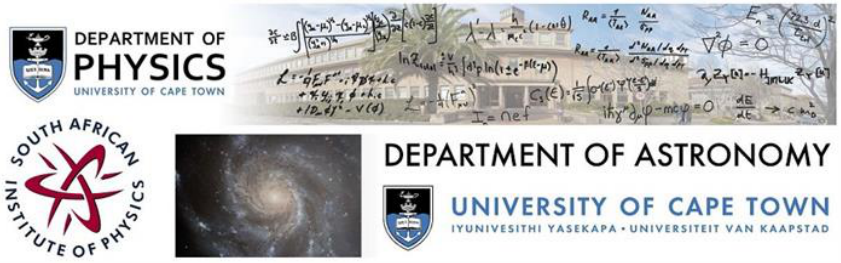

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Fluid Dynamics as a precursor to a "Griffiths level" Electrodynamics course

Friday, 8 July 2016 14:40 (20 minutes)

Abstract content
   (Max 300 words)
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Electromagnetic Theory beyond first year level is recognized as a challenging topic in physics. There are many reasons for this, including the requirement of having to have a grasp of mathematics beyond first level, while at the same time having to deal with levels of abstraction that are not commonplace in first year physics. Very often the topic is taught at second year so that the development of both the mathematics and the physics need to be introduced and mastered at the same time. Historically, many of the concepts that are familiar in electromagnetism were developed by several physicists, including Maxwell, in which the starting point for the abstraction was more tangible objects. For example, the terminology that is used to describe an abstract field has its origins in the area of fluids e.g. divergence and curl, as well as the visualization of a field via "field lines". In an attempt to facilitate the transition to electromagnetism a course has been developed that starts with fluids and develops the necessary tools for engaging meaningfully with electrodynamics. The talk describes the nature of the course and also discusses some aspects of student understanding that appear to be enhanced by following this approach.

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