



Contribution ID: 438

Type: Poster Presentation

## A circular current's bi-Cartesian magnetic dipolar model and the bias in deriving fields from own potentials

Wednesday, 9 July 2014 17:10 (1h 50m)

**Abstract content** [http://events.saip.org.za/getFile.py/?target="\\_blank"](http://events.saip.org.za/getFile.py/?target=) **Formatting & Special chars**

Traditional reliance on deriving fields from potentials where there is symmetry does not explain generally why this may or may not be successful. Our bi-Cartesian dipolar model of a circular current shows that magnetic fields at any field point are derivable from associated Cartesian components of the magnetic vector potential. Then clarifying the bias in deriving fields from own potentials becomes fairly easy. This is done in parallel with that a simple axial electric dipole. It also shows that the traditional an hoc definition of a circular current's magnetic dipolar moment is based on functionally limited component magnetic vector potentials, and is incorrect by a factor of 2.

**Apply to be considered for a student award (Yes / No)?**

NO

**Level for award (Hons, MSc, PhD)?**

None

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

**Primary author:** Dr CHIRWA, Max (Walter Sisulu University)

**Presenter:** Dr CHIRWA, Max (Walter Sisulu University)

**Session Classification:** Poster2

**Track Classification:** Track G - Theoretical and Computational Physics