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## Stochastic differential equations as a powerful numerical tool

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**Abstract content** &nbsp; (Max 300 words) <a href="http://events.saip.org.za/getFile.py/?target=\_blank">Formatting & Special chars</a>

Any diffusion equation (second-order partial differential equation) can, in principle, be re-written into a set (as is the case for higher dimensions) of stochastic differential equations (SDEs), which are, for the most part, much easier to solve numerically. Applying this approach to simulating the propagation of charged particles in astrophysical plasmas, we illustrate the use of this powerful numerical solver. Example solutions are shown and discussed for a variety of different model set-ups and boundary conditions. We also illustrate the effectiveness of this numerical approach when executing the model on parallel computing systems and graphical processing units (GPUs).

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No

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N/A

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