A Symmetry Exploration of the Continuous Medical Implant Model Derived from Two-dimensional Discrete Cases

Conny Adams[1], Jacob Manale[2]
[1] Department of Mathematics & Statistics, Tshwane University of Technology 175 Nelson Mandela Drive, Arcardia Campus, City of Tshwane 008, Gauteng, Republic of South Africa
Adamscm@tut.ac.za
[2] Department of Mathematical Sciences, University of South Africa Corner Christiaan de Wet Road & Pioneer Avenue, Florida 1709, Gauteng Republic of South Africa
manaljm@unisa.ac.za

Keywords: Medical implants, Symmetry analysis.

In their work, Alicia Prieto-Langraica et. al., upscaled a two-dimensional discrete model into a pair of partial differential equations, decribing the interaction of blood cells and bacteria on the surface of a medical implant. Here we use Lie symmetry theoretical methods to deduce the symmetries, then upscale these through a corrected Eulers ansatz, subsequently resulting into practical analytical solutions.