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Usage of manifolds in electromagnetism and superconductor modelling

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Many modelling software packages utilise predetermined coordinate systems and readily embedded metric. However, sometimes these coordinate systems are not practical for modelling or they present too restricted view of the real world. Manifolds and differential geometry offer a more general framework for modelling than coordinate systems can do. For computations we always need some charts, i.e. coordinate systems, of the manifold, but the charts need not be the ones already presented in textbooks. In this paper we consider new modelling possibilities that usage of manifolds offers in electromagnetic modelling of superconductors.

Author: Dr STENVALL, Antti Aleksis (Tampere University of Technology)

Co-authors: Prof. KETTUNEN, Lauri (Tampere University of Technology); Dr TARHASAARI, Timo (Tampere University of Technology)

Presenter: Dr STENVALL, Antti Aleksis (Tampere University of Technology)

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