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## Modelling Fibre Orientation Dispersion in Elastic Arteries

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**Abstract:** In a 2006 paper we developed a rotationally symmetric model to describe collagen fibre dispersion in soft biological tissues based on a generalized structure tensor and incorporated into an anisotropic elastic strain-energy function. This has been highly successful, but recent experimental results on the collagen fibre dispersion in human arterial layers have shown that the dispersion in the tangential plane is more significant than that out-of-plane. A rotationally symmetric dispersion model is not able to capture this distinction. We have therefore introduced a new non-symmetric dispersion model, based on a bi-variate von Mises distribution, which is used to construct a new structure tensor. The latter is incorporated in a strain-energy function that accommodates both the mechanical and structural features of the material, generalizing the rotationally symmetric dispersion model.