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Comparing Arctic Sea Ice Model Simulations to Satellite observations by Multiscale Directional Analysis of Sea Ice Deformation

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Sea ice models have become essential components of weather, climate and ocean models. The reliability of process studies, environmental forecasts and climate projections alike depend on a realistic representation of sea ice. Developing and evaluating sea ice models requires methods for both large scales and fine-scale geomorphological structures such as linear kinematic features (LKF). We introduce a Multiscale Directional Analysis (MDA) method that diagnoses distributions of LKF orientation and intersection angles. The MDA method is different from previous methods in that it (a) takes into account the width of LKFs instead of estimating the orientation of centerlines; (b) separates curve-like features from point-like features providing the opportunity to reach a unified definition of LKF in both numerical and observational fields; (c) estimates scale-dependent intersection angles.