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Likelihood Degenerations

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Computing all critical points of a monomial on a very affine variety is a fundamental task in algebraic statistics, particle physics and other fields. The number of critical points is known as the maximum likelihood (ML) degree. When the variety is smooth, it coincides with the Euler characteristic. We introduce degeneration techniques that are inspired by particle physics. The main objects that will appear are bounded regions in discriminantal arrangements and moduli spaces of point configurations. We present theory and practise, connecting complex geometry, tropical combinatorics, and numerical nonlinear algebra. This is based on a joint project with Daniele Agostini, Taylor Brysiewicz, Lukas Kühne, Bernd Sturmfels, and Simon Telen.

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