



Local powers of optimal one- and multi-sample tests for the concentration of Fisher-von Mises-Langevin distributions

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One-sample and multi-sample tests on the concentration parameter of Fisher-von Mises-Langevin (FvML) distributions have been well studied in the literature. However, only very little is known about their behavior under local alternatives, which is due to complications inherent to the curved nature of the parameter space. The aim of the present paper therefore consists in filling that gap by having recourse to the Le Cam methodology, which has been adapted from the linear to the spherical setup in Ley *et al.* (2013). We obtain explicit expressions of the powers for the most efficient one- and multi-sample tests; these tests are those considered in Watamori and Jupp (2005). As a nice by-product, we are also able to write down the powers (against local FvML alternatives) of the celebrated Rayleigh (1919) test of uniformity. A Monte Carlo simulation study confirms our theoretical findings and shows the finite-sample behavior of the above-mentioned procedures.

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