

Fekete Points

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In this communication we present a new method to estimate Fekete points on surfaces. Our method works in a general setting, in the sense that we can obtain good estimations of the Fekete points on piecewise regular surfaces.

The determination of Fekete points in the unit sphere is considered as a model of a highly non-linear optimization problem with non-linear constraints. In fact, obtaining a robust and efficient algorithm for that problem still constitutes a challenge in computational mathematics [4]. Nevertheless, recent publications recognize that the simple obtaining of a position near a local optimum for hundreds of points in the sphere requires to make use of an important calculation infrastructure [3].

The method here presented is very simple and it is based in a physical interpretation of the behavior of a system of particles when they search for a minimum energy configuration. The algorithm is efficient and robust independently of the surface and the kernel used to define the energy and allows us to work with thousands of particles in very acceptable calculation times, [2]. The problem of the Fekete points has a lot of different applications, see for instance [1]. One of the most important consists in the approximation of the electrostatic charge density of bodies.

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