On the Funk-Finsler structure in constant curvature spaces

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The Funk metric on the unit ball in the Euclidean space is a well-known Finsler metric of constant flag curvature $-\frac{1}{4}$; whereas the Hilbert metric on the unit ball, which is the arithmetic symmetrization of its Funk metric, is of constant curvature -1. The Funk metric on the unit disc is also an example of Randers metric on the unit ball, which can be realized as the deformation of the well-known Klein metric on the ball by a closed 1-form. In 2013, Papadopoulos and Yamada defined the Finsler structure for the Funk and the Hilbert metric on a convex set in the constant curvature spaces. In this talk, we present a Funk-Finsler structure in various models of the hyperbolic plane. In particular, in the unit disc of the Klein model, it turns out to be a Randers metric, which is a non-Berwald Douglas metric. Further, using Finsler isometries we obtain the Funk-Finsler structures in other models of the hyperbolic plane.