MAXIMUM LIKELIHOOD ESTIMATION IN EXPONENTIAL ORTHOGEODESIC MODELS

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Abstract. An orthogeodesic statistical model is defined in terms of five conditions of differential geometric nature. These conditions are reviewed together with a characterization theorem for exponential orthogeodesic models. Orthogonal projections, relevant for maximum likelihood estimation in exponential orthogeodesic models, are described in a simple way in terms of some of the quantities in the characterization theorem. A unified procedure for performing maximum likelihood estimation in exponential orthogeodesic models is given and the use of this procedure is illustrated for some of the most important models of this kind such as θ-parallel models, τ-parallel models and certain transformation models.

Key words and phrases: Affine α-connections, expected information, flat submanifolds, geodesic submanifolds, likelihood equations, orthogonal projections, pivot, transformation models, τ-parallel models, θ-parallel models.