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Comment on "Hierarchical Bayesian space-time interpolation versus spatio-temporal BME approach" by Hussain et al. (2010)

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This is a clarifying comment regarding the article "Hierarchical Bayesian space-time interpolation versus spatio-temporal BME approach" (Hussain et al., 2010). In the article, the authors present a very interesting methodological study to compare the results obtained by the Bayesian Maximum Entropy (BME) and hierarchical Bayesian interpolation (HBI) techniques in a spatiotemporal context. The study concludes in declaring HBI a more accurate contestant that also produces lower prediction error, compared to BME.

BME began its development as a novel approach and an improvement in space-time analysis in the early 1990's (Christakos, 1990, 1992, 2000). BME has a distinctive edge compared to the classical linear model predictive approaches because its foundations are free from restrictions and assumptions typically present in competing methods (e.g., data distribution assumptions, consideration of soft data as hard values, etc.), and it can incorporate a broader spectrum of information such as uncertain observations, probabilistic data, physical laws, etc. Naturally, like any consistent theory, BME includes pre-existing theories as its special cases. The article authors are clear, accurate and explicit in stating that they apply BME kriging in their study, that is, they apply the limited case of BME when it is mathematically reduced to the kriging classical technique.

The above remark is at the heart of my comment: The article describes inaccurately the comparison as HBI versus BME, because the conclusions place the critique on the BME methodology in its entirety without having used any of the exclusive BME features (e.g., use of soft data, physical laws, non-linear prediction). To the informed reader, the article essentially illustrates a comparison between HBI and kriging applied through BME software. I think this clarification is necessary to prevent readers that are less familiarized with BME from forming an erroneous opinion about the methodology. I strongly encourage, welcome, and could also assist, if asked, in follow-up similar studies to support fair comparison between BME and other geostatistical techniques.

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