

Expert elicitation to improve mathematical models

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To enable standard parameter estimation using a mathematical Gauss-Markov model, the functional model needs to be established, which relates the unknown parameters to the observations. Additionally, constraints can be defined to limit the solution space. In standard geodetic practice, it is assumed that the information to establish the optical functional model is readily available. In practice, this is hardly ever the case, and the setup of the model depends on a-priori (or contextual) information that needs to be obtained from other sources.

Often, domain experts are the best source for this contextual information. Particularly for techniques such as radar interferometry, the actual observations reflect a multitude of physical processes, with varying spatio-temporal resolution, smoothness, and extent.

Here we present a standardized approach to obtain this a priori information using Expert Elicitation. Our goal is to derive a generic standardized approach to obtain the required information for (i) optimal parameter estimation, and (ii) communicating the important assumptions underlying the final results to other stakeholders.

We demonstrate our approach in specific geophysical and geotechnical case studies.