How Can We Combine Individual Solutions From Different Space Geodetic Techniques by the Bayesian Approach?

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The comparison and combination of all common parameters from different space geodetic techniques (VLBI, SLR/LLR, GPS/GLONASS, DORIS, Altimetry) is necessary to check the agreement between the techniques and achieve a higher accuracy and reliability of geodetic data and therefore a better understanding of system Earth. There are some studies about the comparison of one specific parameter set (e.g., the station coordinates and the troposphere zenith delays at co-located sites, or Earth rotation parameters) from different space geodetic techniques. For combining different space geodetic techniques in the common parameter space, it is necessary to apply different models and different approaches to get more reliable results. This combination procedure requires complex algorithms. In this study, we go through the combination issue in a way that is different from existing analysis strategies. The main purpose of this study is to give an idea how we can apply the Bayesian approach to combine individual solutions from GPS and VLBI in the common parameter space. Bayesian procedures have a dominating position in statistical applications nowadays and are applied in a wide range of scientific fields. It is also well-known that the Bayesian framework is especially well suited for the combination of different sources of information.