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## Capon's method for planetary magnetic field analysis

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Minimum variance distortionless projection, the so-called Capon method, serves as a powerful and robust data analysis tool when working on various kinds of ill-posed inverse problems. The method has not only successfully been applied to multipoint wave and turbulence studies in the context of seismics and space plasma physics, but it is also currently being considered as a technique to perform the multipole expansion of planetary magnetic fields from a limited data set, such as Mercury's magnetic field analysis. The mathematical foundations and the practical application of the Capon method are discussed in a rigorous fashion by extending its linear algebraic derivation in view of planetary magnetic field studies. Furthermore, the optimization of Capon's method by making use of diagonal loading is considered.