"Explicit variational forms for the inverses of integral operators for the Laplace equation in the exterior of a flat disk in $\mathbb{R}^3$.

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Abstract

We introduce variational formulations for the weakly- and hyper-singular operators (as well as for their corresponding inverses) associated to the Laplace operator in the domain of $\mathbb{R}^3$ exterior to a flat open disk in $\mathbb{R}^3$. Using adequate basis functions on the disk, we obtain an exact expression for the associated kernels. This work is an extension to $\mathbb{R}^3$ of the article by Jerez-Hanckes and Nédélec (2012, Explicit variational forms for the inverses of integral logarithmic operators over an interval.