

Hadamard renormalisation for charged scalar fields

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The Hadamard prescription provides a powerful and axiomatic approach to renormalising the stress-energy tensor in the study of quantum fields in curved spacetime. The procedure has been developed by Decanini and Folacci for massive scalar fields in a general spacetime of arbitrary dimension. We extend their work to include spacetimes with a gauge field and explicitly develop the Hadamard renormalisation procedure for dimensions up to four. Finally, we compare our results to those already obtained using the DeWitt renormalisation method.