

The Pseudodifferential calculus and Hadamard states

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In this talk we will describe the use of pseudodifferential calculus to construct and study Hadamard states for free Klein-Gordon fields on globally hyperbolic spacetimes. Pseudodifferential calculus on manifolds is a standard tool of microlocal analysis which actually predates the notion of wavefront set. We will give a brief description of various pseudodifferential calculi on manifolds and relate the construction of Hadamard states done with Michal Wrochna and Omar Oulghazi with the well-known method of the mode expansion in the case of cosmological spacetimes. We will also give a new proof of the Hadamard property of the Hartle-Hawking-Israel state for static bifurcate Killing horizons due to Sanders.