The Bessel operator with an inner singularity and Pontryagin spaces

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We consider the Bessel operator on an interval $[0, a)$ where $a > 1$, and with the singularity at $x = 1$. At this singularity the differential operator is in limit point case from both sides. We describe a general class of interface conditions at $x = 1$ which lead to self-adjoint operators in a Pontryagin space.

Joint work with Malcolm Brown and Matthias Langer.