
ON PAIRS OF COMPLEMENTARY BOUNDARY AND TRANSMISSION
CONDITIONS

Elżbieta Ratajczyk and Adam Bobrowski

Many a partial differential equation does not describe biological or physical phenomena well, unless it is equipped with appropriate boundary or transmission condition(s), and these come in varieties. We will argue that the well-known Robin boundary condition $f'(0) = \alpha f(0)$ is in a sense complementary to the less often used sticky boundary condition $f''(0) = \alpha f'(0)$. To explain: there is an intimate connection between boundary conditions and invariant subspaces for the related solution families of operators (e.g. semigroups or cosine operator functions); it turns out that the invariant subspaces for the Robin and sticky boundaries are nearly perpendicular to each other. We will also exhibit a pair (or two) of transmission conditions with analogous property.

Elżbieta Ratajczyk and Adam Bobrowski, Lublin University of Technology
e-mail : e.ratajczyk@pollub.pl; a.bobrowski@pollub.pl
