

Fredholm index of Wiener-Hopf-Hankel operators with *PAP* symbols

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Abstract

It will be presented a formula for the sum of the Fredholm indices of the Wiener-Hopf plus and minus Hankel operators acting between L^2 Lebesgue spaces, and having piecewise almost periodic (*PAP*) Fourier symbols. More precisely, it will be presented a formula that relates the Fredholm index of the Wiener-Hopf plus Hankel operator with the Fredholm index of the Wiener-Hopf minus Hankel operator based on the winding number of a piecewise almost periodic function (constructed from the initial Fourier symbol of the operators). The index formula will be interpreted upon different cases of symmetries of the discontinuities of the Fourier symbols, leading to the simplification of the formula of the winding number of the piecewise almost periodic function. Several examples will be presented to illustrate the index formula. Finally, the (both-sided) invertibility of the operators in study will be also discussed.