Factorizations, Riemann-Hilbert problems and the corona theorem

I.M. Spitkovsky

The solvability of the Riemann-Hilbert boundary value problem on the real line is described in the case when its matrix coefficient admits a Wiener-Hopf type factorization with bounded outer factors but rather general diagonal elements of its middle factor. This covers, in particular, the almost periodic setting, when the factorization multiples belong to the algebra generated by the functions $e_\lambda(x) := e^{i\lambda x}$, $\lambda \in \mathbb{R}$. Connections with the corona problem are discussed. Based on those, constructive factorization criteria are derived for several types of triangular 2×2 matrices with diagonal entries $e_{\pm\lambda}$ and non-zero off diagonal entry of the form $a_-e_{-\beta}+a_+e_\nu$ with $\nu, \beta \geq 0$, $\nu+\beta > 0$ and $a_\pm$ analytic and bounded in the upper/lower half plane.

The talk is partially based on joint work with M.C. Câmara, C. Diogo and Yu.I. Karlovich.