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## Some boundary value problems in conical Riemann surfaces

This contribution aims at the explicit analytical representation of acoustic, electromagnetic or elastic, time-harmonic waves diffracted from wedges in  $\mathbb{R}^3$  in a correct setting of Sobolev spaces. Various problems are modelled by Dirichlet or Neumann boundary value problems for the  $2D$  Helmholtz equation with complex wave number.

They have been analyzed before by several methods which lead to results which are particularly useful for asymptotic and numerical treatment. Here we develop new representation formulas based upon solutions to Sommerfeld diffraction problems and we use symmetry properties that need a generalization of these formulas to Riemann surfaces in order to cover arbitrary rational angles. The approach allows to prove well-posedness in suitable Sobolev spaces and to obtain explicit solutions in a new, perhaps surprising, form provided the angle is rational.

The talk is based upon joint work with T. Ehrhardt and A.P. Nolasco.