

# Meeting on Computational and Analytic Problems in Spectral Theory

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## Abstract of Talk

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### ORDINARY DIFFERENTIAL OPERATORS WITH SINGULAR COEFFICIENTS

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Classical theory of symmetric differential operators allows to work with differential expressions of the form

$$(1) \quad \ell_{2n}[y] := \sum_{k=0}^n (-1)^{n-k} (p_k y^{(n-k)})^{(n-k)} + \\ + i \sum_{k=0}^{n-1} (-1)^{n-k-1} \{ (q_k y^{(n-k-1)})^{(n-k)} + (q_k y^{(n-k)})^{(n-k-1)} \},$$

provided that the coefficients  $p_k$ ,  $q_k$  and  $(p_0)^{-1}$  are locally integrable functions. This theory was developed in the works of D.Shin, N.Glazman, A.Zettle, N.Everitt et al. Our goal is to extend the frames of the classical theory and to define operators associated with non-symmetric differential expressions

$$(2) \quad \tau(y) = \sum_{k,s=0}^n (r_{ks} y^{(n-k)})^{(n-s)}$$

whose coefficients  $r_{ks}$  are distributions of finite order singularity (depending on the indices  $k, s$ ). We shall discuss several approaches to this problem. The most important one is based on the so-called regularization procedure.

The talk is based on the joint paper with prof. K.A.Mirzoev.