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CENTRAL PART INTERPOLATION AND PRODUCT INTEGRATION METHOD FOR WEAKLY SINGULAR FREDHOLM INTEGRAL EQUATIONS

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In the first part of the talk the regularity of a solution to a linear Fredholm integral equation of the second kind is discussed. The kernel of the integral equation may have weak diagonal and boundary singularities. Assuming certain differentiability properties of the kernel and free term, we discuss the growth rates of the derivatives of the exact solution near the boundary of the domain of integration. In the second part we perform a change of variables which improves the boundary behaviour of the kernel and exact solution. After that, using a central part interpolation by polynomials on the uniform grid, we solve the transformed equation by the product integration method. Global convergence estimates are presented and a collection of numerical results is given.