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William Gryc, Loredana Lanzani, Jue Xiong* (jue.xiong@colorado.edu) and **Yuan Zhang**. *Neumann boundary condition for $\bar{\partial}$* . Preliminary report.

Suppose Ω is a smooth bounded domain in \mathbb{C} and let $H^2(\Omega)$ denote the classical Hardy space on Ω . It is well known that $H^2(\Omega)$ is the data space of the Dirichlet problem for the $\bar{\partial}$ operator on Ω . The solution has an integral representation using the Cauchy kernel function. A natural question to ask is to identify the data space of the Neumann boundary condition for $\bar{\partial}$ on Ω . For the unit disc in \mathbb{C} , it turns out that we can solve the Neumann problem within the classical Dirichlet space. Moreover, the solution can be represented via the Dirichlet kernel function. For Ω smooth simply connected, a promising candidate is the generalization of the Dirichlet space on such domain. We'll also investigate the Neumann problem for domains in higher dimensions and its connections to the Dirichlet problem. This is a joint work inspired by the SCV workshop the speaker attended at AIM in April 2019. (Received September 17, 2019)