

Singular SPDEs with the Cauchy-Riemann operator on a torus

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We prove the existence of solution to the following $\mathbb{C}^3$ -valued singular SPDE on the 2D torus $\mathbb{T}^2$:

$$\partial_{\bar{z}} r = rx\bar{r} + i\gamma\mathscr{W},$$

where $\partial_{\bar{z}} := \frac{1}{2}(\partial_x + i\partial_y)$ is the Cauchy-Riemann operator on $\mathbb{T}^2$, $\mathscr{W}$ is a real 3D white noise on $\mathbb{T}^2$ whose third component has zero mean over $\mathbb{T}^2$, $\gamma := (\gamma_1, \gamma_2, \gamma_3)$ is an $\mathbb{R}^3$ -vector and $\gamma\mathscr{W} := (\gamma_1\mathscr{W}_1, \gamma_2\mathscr{W}_2, \gamma_3\mathscr{W}_3)$. This talk is based on a joint work with Zdzisław Brzezniak and Mikhail Neklyudov.

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