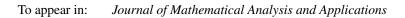# Accepted Manuscript

Local Martingale Solutions to the Stochastic Two Layer Shallow Water Equations with Multiplicative White Noise

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Abstract

We study the two layers shallow water equations on a bounded domain $\mathcal{M} \subset \mathbb{R}^2$ driven by a multiplicative white noise, and obtain the existence and uniqueness of a maximal pathwise solution for a limited period of time, the time of existence being strictly positive almost surely. The proof makes use of anisotropic estimates and stopping time arguments, of the Skorohod representation theorem, and the Gyöngy-Krylov theorem which is an infinite dimensional analogue of the Yamada-Watanabe theorem.

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