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On the controlliability of the damped-driven KdV equations and applications. Preliminary report.

This talk will discuss, in the context of the damped-driven KdV equations, an approach recently developed by Glatt-Holtz, Herzog, and Mattingly for establishing controllability. In particular, this approach provides a versatile framework for constructing controls that achieve global approximate controllability and exact controllability in finite-dimensional subspaces. We highlight the difficulties one faces with this approach in the case of the damped-driven KdV equation, how they can be overcome, as well as discuss applications of the result in the stochastically forced case to unique ergodicity and non-degeneracy of the Malliavan matrix. This is joint work with Nathan Glatt-Holtz (Tulane) and Geordie Richards (Utah State). (Received August 05, 2020)