1. Report on "Wideband Fading Channels With Feedback" by Shashi Borade and Lizhong Zheng

The paper deals with the capacity for wideband Gaussian channels with feedbacks. It derived an approximation for the time domain water-filling capacity of a wideband Gaussian channel when SNR approaches 0. This has several interesting consequences:
a) The capacity is approachable using a simple on-off strategy.
b) The capacity is approachable even with a single bit of CSIT and no CSIR.
c) When the CSIT is noisy, the capacity reduces linearly with the accuracy of the CSIT.
d) For the block fading channel with coherence time T, the capacity increases linearly with logT.

It is understandable that things will become much simpler when SNR approaches zero (and so does rate). We would expect some simplified characterizations of system behavior in such a limiting case. This paper gives such simplified characterizations and also provides several useful insights, which I personally find illuminative. For example, the authors revealed an interesting fact that although feedback information is crucial for the low-rate regime, (as the ratio of the capacity with and without water-filling goes to infinity in the limit of small), only very limited feedback suffices. This is enlightening.

Overall, this is a very good paper. However, I am not sure whether the contributions warrant the IT Award, since one may argue that the near zero rate scenario is relatively easy to handle through linearization of a non-linear problem.