

## Wireless Link Adaptation Policies: QoS for Deadline Constrained Traffic with Imperfect Channel Estimates

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We present an optimal power and rate control policy for delay constrained traffic in next generation TDMA wireless systems. Our solution minimizes average transmit power while satisfying a constraint on the distribution of packets lost to deadline expiration. We also provide a means to account for erroneous and delayed channel estimates. Our results show the optimal power and rate adaption may change dramatically as mobile speed and channel estimate delay increase. Finally, we present results from a simulation of a GSM EDGE mobile. This simulation incorporates industry standard wireless channels and performance data available from the Third Generation Partnership Project. When compared to the standard Fixed-SIR power control policy, our algorithm provides a significant reduction in power consumption and mitigates some of the negative effects of delayed channel estimates.