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Zhifeng Zhang* (zzhang@lsp1ab.com), 33 Whitehall, New York, NY 10004. *A Multi Time Scale Microstructure Model — An Empirical Study*. Preliminary report.

In this study, we investigate the relationship between observed market price with trade direction and trade size from the high frequency data. Such investigation is done through a multi time scale microstructure model. The model follows the framework in Roll's model where the traded price is decomposed into fair value (non-observable) and market impact (product of direction and size). We model the fair value as a diffusion process with the drift as a function of a slow switching two-state markov process. This captures the low frequency variation of the intraday data and the fact that fair value should not be changed very quickly. The drift term and the noise term can be interpreted as the results from the "informed" trader's and the "noise" trader's activities respectively. We break the market impact into two parts: a fast switching and a slow switching markov processes. The former captures the frequent small trades while the later one models the trades with big sizes. We develop an empirical algorithm to identify changing points for each markov process as well as estimating of the trade directions and statistical properties of the noise. Empirical evidences are presented. (Received September 13, 2007)