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An agent based model of the E-Mini S&P 500 applied to flash crash analysis

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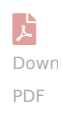Ⓡ 🔗 © 🗂 🔔

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We propose a zero-intelligence agent-based model of the E-Mini S&P 500 futures market, which allows for a close examination of the market microstructure. Several classes of agents are characterized by their order speed and order placement within the limit order book. These agents' orders populate the simulated market in a way consistent with real world participation rates. By modeling separate trading classes the simulation is able to capture interactions between classes, which are essential to recreating market phenomenon. The simulated market is validated against empirically observed characteristics of price returns and volatility. We therefore conclude that our agent based simulation model can accurately capture the key characteristics of the nearest months E-Mini S&P 500 futures market. Additionally, to illustrate the applicability of the simulation, experiments were run, which confirm the leading hypothesis for the cause of the May 6 [th] 2010 Flash Crash.

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