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Metered poppet valve

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The metering poppet valve is a new design that is trying to maximize stability and performance. Poppet valves are typically not used as metering valves because they have stability issues. This new valve is trying to rectify the stability issues while maintaining the fast response time. The drawings of the poppet valve have been finalized, a mathematical model and an experimental setup have been developed. Once the new valve arrives, it will be implemented into the experimental setup. The Vickers Valvistor poppet valve has been used to prepare the test valve setup. A flow meter, three pressure sensors, and a LVDT sensor has been hooked into the system and then calibrated. A solenoid was attached to the valve which is controlled by Real-Time workshop on a computer. All of the data is sent to the computer and stored. The subject of dither was looked into. Dither is adding a sine wave to a signal to keep the poppet from experiencing static friction which gives a better response. The optimum frequency and amplitude for the sine wave was determined experimentally using a triangle input and measuring hysteresis. Frequency response testing is occurring to try and construct a bode plot for the valve. From the bode plot, the system's transfer function will be obtained which will be used to validate the model of the valve. All of this work is just for preparation for arrival of the new poppet valve. Once the new valve arrives, it will be implemented into the system in a similar way and the same tests will be run in order to validate the system model and illustrate the performance of this new valve.