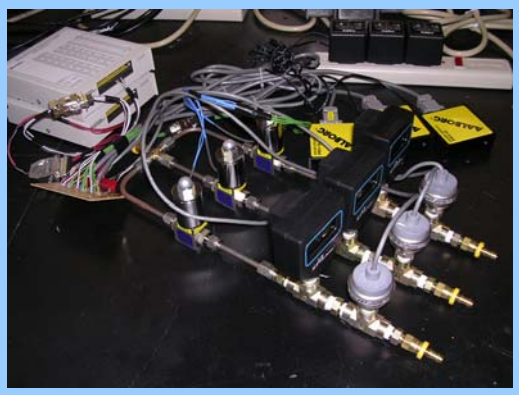
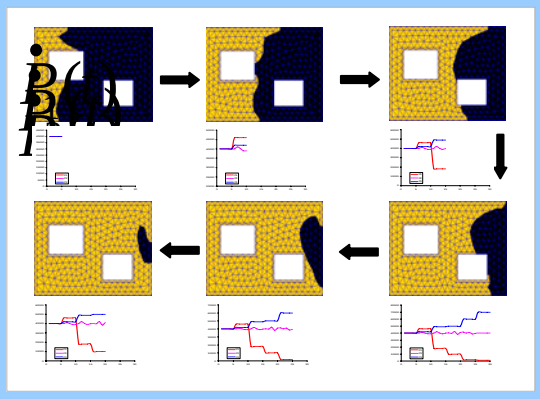
Synopsis:
Intelligent Control of Liquid Composite Molding Process



RTM process control testbed



Time-dependent pressure control profiles

Background

Liquid Composite Molding (LCM), including RTM and VARTM, is a complex manufacturing process involving many variables whose relationships are yet to be fully known. For this reason, LCM requires a different control paradigm - one which provides for the representation of uncertainties and higher-level decision making. HPMI is developing and testing effective control algorithms for use when only limited amounts of data are available for RTM and VARTM process controls to ensure that part quality, process performance, and part-to-part reproducibility are maintained.

Goals

- Develop an automatic control testbed for RTM/VARTM
- Understand governing phenomena in the realm of flow control
- Develop and test control models and algorithms for RTM/VARTM process controls

Projects/Research Highlights

- Development of an RTM/VARTM process control testbed
- Development of a model-based RTM process control system with gas assisted, in-situ whole field permeability measurement
- Development of effective fuzzy logic-based RTM/VARTM process control algorithm using a limited number of sensors

Benefits to Industry

- Minimize cost
- Improve first time yield
- Maximize process performance by maintaining variables at the desired setting for achieving manufacturing objectives