

# Sensitivities and Generalized Sensitivities for a Model of the Cardiovascular System

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**Abstract.** The validation of models for physiological systems is usually characterized by a large number of parameters which have to be identified and a rather limited amount of measurements for states or outputs of the system [1]. Part of the validation process should be an elaborate sensitivity analysis in order to quantify the dependence of state or output variables on parameters and thus to determine those parameters which have to be estimated with high precision. Generalized sensitivities [4] characterize the information content of measurements for specific parameters and thus can be a useful tool for the design of experiments.

In the talk we first discuss sensitivities and generalized sensitivities. Then we present the results of a sensitivity respectively generalized sensitivity analysis for a model of the cardiovascular system.

## REFERENCES

- [1] J. J. Batzel, F. Kappel, D. Schneditz and H. T. Tran, *Cardiovascular & Respiratory Systems: Modeling, Analysis & Control*, *Frontiers in Applied Mathematics*, SIAM, Philadelphia 2007.
- [2] K. Thomaseth and C. Cobelli, *Generalized Sensitivity Functions in Physiological System Identification*, *Ann. Biomedical Eng.* **27** (1999), 607–616.