Proposed title: **Numerical simulations in Thermal Field and Environmental Engineering**

Research area: Mechanical engineering, Thermal engineering

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Conf.dr.ing. Francisc Popescu
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The monograph structure:

1. *Brief description of the numerical modeling activities in the frame of Chair for Thermodynamics*
   Authors: Paul Dan Oprișa-Stănescu, Dorin Lelea, Francisc Popescu, Adrian Eugen Cioabla

The research activities related to heat transfer and fluid flow numerical simulations started in 1990, once the laboratories have been equipped with PC – 286. The first software used for numerical modeling was ***ELCUT 3.0***. Also the in-house codes have been developed by Conf.dr.ing. Paul-Dan Oprișa-Stănescu and Prof.dr.ing. Romeo Resiga-Susan. Lately the ***Fluent*** commercial code has been acquired and used for numerical simulations in research areas like combustion phenomena, heat transfer and microchannel heat transfer. More recently in the field of environmental engineering the Gauss dispersion commercial codes - ***AQM*** models are used.

2. *Numerical simulations of combustion phenomena*
   Authors: Paul Dan Oprișa-Stănescu, Adrian Eugen Cioabla

In 1997 The ***Fluent 5.0*** commercial software was acquired and used for numerical simulations for combustion phenomena inside the pulverized coal – fired boilers. Besides the formation of Nitrogen oxide pollutants was modeling. Moreover the compressible fluid flow of axial and radial ejectors have been simulated.

3. *Numerical simulations in the Environmental Engineering*
   Authors: Francisc Popescu

University Politehnica Timisoara expertise and experience in air quality modeling ***AQM*** is in agreement with experience and development on both American and Europe continents, that enclosed ***HYSPLIT*** , ***AERMOD, CALPUFF*** and ***CERC ADMS5*** – a new generation Gaussian plume air dispersion model.

4. *Numerical simulations of Microchannel heat exchangers*
   Authors: Dorin Lelea, Adrian Eugen Cioablă

The microchannel thermal devices gained the interest in the recent years due to large cooling capabilities with emphasize in microelectronics. The numerical simulations of microchannel heat transfer and fluid flow has been made both with in-house codes based on finite volume method and ***Ansys-Fluent*** commercial software.