Contenu site internet

Julien Berger[1] & Xavier Provencal[2]

[1] CNRS – LOCIE UMR 5271, Université de Savoie Mont-Blanc,
73376 Le Bourget-du-Lac, France
[2] CNRS - LAMA UMR 5127, Université de Savoie Mont-Blanc,
73376 Le Bourget-du-Lac, France

April 3, 2017

1 Page principal

Titre: Parametric model in Building Physics

(à inclure sous le titre): This website presents the recent development of parametric model in the context of building physics, based on the use of Proper Generalized Decomposition [REF avec le lien url: https://hal.archives-ouvertes.fr/hal-01004940].

Groupe 1: Moisture diffusion in porous material
Description: The physical problem involves one-dimension moisture diffusion through a porous material. The material is submitted to a cyclic increases of relative humidity on one side and constant relative humidity on the other side. The permeability and storage coefficients do not depend on the moisture content. The model is computed as a function of the moisture storage capacity, the space and time.
Groupe 2: Heat conduction in insulated wall
Description: The physical problem involves one-dimension heat diffusion through a multi-layer wall. The latter is composed of a load material and an insulation part. The wall is submitted to climatic transient boundary conditions on one side and sinusoidal temperature variation on the other side. A parametric solution is computed as a function of the space and time coordinates, as well as the thermal insulation thickness and the load material thermal diffusivity.

2 Moisture diffusion in porous material

Titre: Parametric model in Building Physics
Nom du model: Moisture diffusion in porous material

Description: The physical problem involves one-dimension moisture diffusion through a porous material. The material is submitted to a cyclic increases of relative humidity on one side and constant relative humidity on the other side. The permeability and storage coefficients do not depend on the moisture content. The model is computed as a function of the moisture storage capacity, the space and time.
Documentation: The dimensionless governing equations are written as:

$$c\,\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} \qquad t \in \left[0,\,1\right], \qquad x \in \left[0,\,1\right], \tag{1a}$$

$$u = 1 \qquad t > 0, \qquad x = 0, \tag{1b}$$

$$-\frac{\partial u}{\partial x} = \mathrm{Bi}\cdot\left(u - u_\infty\right) \qquad t > 0, \qquad x = 1, \tag{1c}$$

$$u = 1, \qquad t = 0, \qquad x \in \left[0,\,1\right]. \tag{1d}$$

Commentaires: ce LaTeXprovient des metadonnees du groupe. Faut il mettre du LaTeXdans un fichier txt?

Numerical application:
Commentaires: il faudrait voir pour actualiser cete partie en fonction des metadonnees du set. Faut il mettre du LaTeXdans

un fichier txt?

$$u_\infty = 1 + 1.6 \cdot \sin\Big(\frac{2\,\pi}{0.4}\,t\Big)^2\,, \qquad \mathrm{Bi} = 10\,, \qquad c \in \big[c_{\min}, c_{\max}\big]$$

Commentaires: Concernant les metadonnes du set, j'ai ajouté une colonne "valeur initiale". Pour u, la valeur u_0 est utilisé comme valeur de d'initialisation de la somme. Pour les variables où la valeur initiale n'est pas définie, j'ai rempli par NaN (not a number).
Référence:

Commentaires: Nous n'avons pas encore terminé l'article donc je n'ai pas le pdf et le lien url finaux. Je vous ai quand même mis des liens url dans les méta-données groupe et un pdf à inclure

3 Heat conduction in insulated wall

Titre: Parametric model in Building Physics
Nom du model: Heat conduction in insulated wall

Description: The physical problem involves one-dimension heat diffusion through a multi-layer wall. The latter is composed of a load material and an insulation part. The wall is submitted to climatic transient boundary conditions on one side and sinusoidal temperature variation on the other side. A parametric solution is computed as a function of the space and time coordinates, as well as the thermal insulation thickness and the load material thermal diffusivity.
A continuer de ma part! ;-)