

Lundi 4 juillet 2011, 9h00 – 12h00



Amphi Claude Chappe – Campus LyonTech - La Doua - INSA de Lyon

Conférences sur les nouveaux concepts de capteurs solaires hybrides photovoltaïques/thermiques

Ce sujet s'inscrit dans le contexte des recherches menées sur les bâtiments à très haute performance énergétique. Il est relié aux travaux portant sur de nouveaux concepts d'enveloppe active et multifonctionnelle pouvant couvrir tout ou partie des besoins énergétiques du bâtiment (électricité, chaleur, froid). Les travaux présentés portent sur le développement de capteurs solaires hybrides photovoltaïques/thermiques pour la production simultanée de chaleur et d'électricité au sein d'un unique composant.

Professeur G.N. TIWARI – Centre for Energy Studies, Indian Institute of Technology Delhi

« Photovoltaic Thermal (PVT) systems at IIT Delhi »

The photovoltaic thermal PVT system provides both thermal and electrical energy by using solar energy. The PVT system has many applications namely water heating and building integrated system. The PVT systems should be analysed either by using the first law or second law of thermodynamics. Further, Life Cycle cost analysis including energy matrices should also be analysed. The carried out on PVT at IIT Delhi, New Delhi in India will be covered during the presentation.

Professeur T.T. CHOW City University of Hong-Kong – BEETRU

« Photovoltaic and Solar Thermal Technology »

A significant amount of research and development work on the photovoltaic/thermal (PVT) technology has been done since the 1970s. Many innovative systems and products have been put forward and their quality evaluated by academics and professionals. A range of theoretical models has been introduced and their appropriateness validated by experimental data. Important design parameters are identified. Collaborations have been underway amongst institutions or countries, helping to sort out the suitable products and systems with the best marketing potential. This speech deals with a review of the trend of development of the technology, in particular the advancements done at City University of Hong-Kong.

**Dr. P. DUPEYRAT Fraunhofer-Institut ISE Fribourg (Allemagne)-
CETHIL UMR 5008/INSA/UCB Lyon**

« Experimental development and simulation investigation of a Photovoltaic-Thermal hybrid solar collector »

This study is based on a multi-scale approach that combines both numerical and experimental investigations regarding the feasibility of the concept of hybrid solar collector. Based on improved processing methods and improved material properties, an efficient covered PV-T collector has been designed and tested. This collector was made of PV cells connected to the surface of an optimized flat heat exchanger by an improved lamination process and covered on the front side by a static air layer and AR-coated glass pane and on the back side by thermal insulation material. The results showed a significant improvement of both thermal and electrical efficiency in comparison to all previous works on PV-T concepts found in the literature. Numerical simulation of the system led on a Building Physics Software show that the integration of PV-T collectors can be more advantageous than standard solar components in regard to thermodynamic considerations (energy and exergy) and environmental considerations (CO₂ and primary energy saving).

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Chaire INSA de Lyon – EDF « Habitats et Innovations Energétiques »-CETHIL