

# SAIP 2011



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## **Comparative Efficiency Study of a Solar Trough Receiver: Hot mirror and Selective coating**

Wednesday 13 Jul 2011 at 12:15 (00h15')

### **Content :**

We consider a solar trough system in which cylindrical parabolic mirrors focus the sun's radiation onto a receiver pipe, heating it. Conventionally, the pipe is enclosed in a glass cover under vacuum and the dominant radiation losses are reduced by the use of a selective coating on the receiver pipe. We study the suitability of applying a 'hot mirror' coating on the glass cover instead, which transmits in the visible but reflects well in the infra-red. We compare the performance of the 'selective' with a 'hot mirror' coating using the results from simulations for a general heat transfer model. It is seen that a hot mirror is a viable alternative, and certainly allows higher temperatures of the working fluid and therefore higher Carnot efficiency. The optimum is a hybrid system, with selective coating applied at the low temperature end of the receiver pipe and the hot mirror being used at higher temperatures.

### **Level (Hons, MSc, PhD, other)? :**

I am a Msc student

### **Consider for a student award (Yes / No)? :**

yes

### **Short Paper :**

Yes

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