

Seminar
of the Department of complex matter F7

Friday, 6.7.2018 at 13:00,
Seminar room F7

Study of the efficiency of the solar updraft tower as a function of its height

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With the constant increase in pollution, the need to find new systems that provide clean energy becomes more and more important. One of these solutions could be the solar updraft tower. This tower allows us to create electrical energy from the solar energy. Air is heated by solar radiation under a circular transparent roof open at the periphery. In the middle of this collector is a vertical tower with air inlets at its base. As hot air is lighter than cold air it rises up the tower. Suction from the tower then draws in more hot air from the collector, and cold air comes in from the outer perimeter. Therefore, turbines at the base of the tower generates electricity.

The goal of this project was to find out how the height of the tower influences its efficiency. Using a very simple theoretical model and making measurements on a real model, it can be seen that the height varies with the air velocity in power of $1/2$, and with the recoverable power in power of $5/2$. This model remains correct for heights lower than 1m which is very limiting. Finally, many improvements remain to be made, such as the theoretical model, geometry, materials and precision.

The lecture will be held in English.

Cordially invited to attend.

