| | Task from course AE1B13SVS |
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| Laboratoř Fotovoltaických Systémů & Elektrochemických Zdrojů Katedra Elektrotechnologie ČVUT FEL | Task Name: Measurement of spectrums of various radiation sources |
| | Version: 2014/1.0 |

# Measurement of spectrums of various radiation sources

## Task:

Measure spectrum of following radiation sources:

- Bulb (halogen)
- LED diodes (various colors)
- Fluorescent lamp
- Glow lamp

The measured spectra compare in terms of usability of radiation for crystalline silicon cell.

## Procedure:

1) Measure the spectrum of the radiation source. The curve on the screen of spectrometer adjust to available screen area.
2) From the measured spectra record the course of intensity for each wavelength. Reduce only to values usable by silicon photovoltaic cell.
3) Record the values in table form, step of wavelength select according to the complexity of the course.
4) Measured values norm by using the maximum achieved value.
5) Perform a similar procedure for spectrum AM 1.5.
6) Wavelength recalculate on the energy.
7) Calculate the percent utilization of the appropriate wavelength, ie calculate the conversion efficiency of radiation of a given wavelength to electrical energy.
8) Multiplying this effectiveness by normalized radiation intensity you will obtain the supplement of given wavelength to the effective density of radiation intensity.
9) Obtained values numerically integrate and thus obtain the effective spectral density of the radiation intensity. Compare single light sources with respect to their theoretical density of the effective radiation density.

## Example: see attachment

## Conclusion

One selected student will process the tasks mentioned above in the form of a paper report and a 5 minute presentation. The paper report gives student at the beginning of the next exercise, during the presentation of the conclusions of the measurements. Before exercise student uploads an electronic version of a paper and presentation to Moodle. There is not stable Internet connection in the laboratory, so the presentation will be projected from a student's flash drive. Recommended format is ppt, pptx.