Exercise

Master's degree in environmental science and engineering

Occupational and environmental health

3.3 Physical hazards - radiation

Consider the Suva reference values in your exercise: https://www.suva.ch/fr-ch/prevention/themes-specialises/radioprotection-et-radioactivite

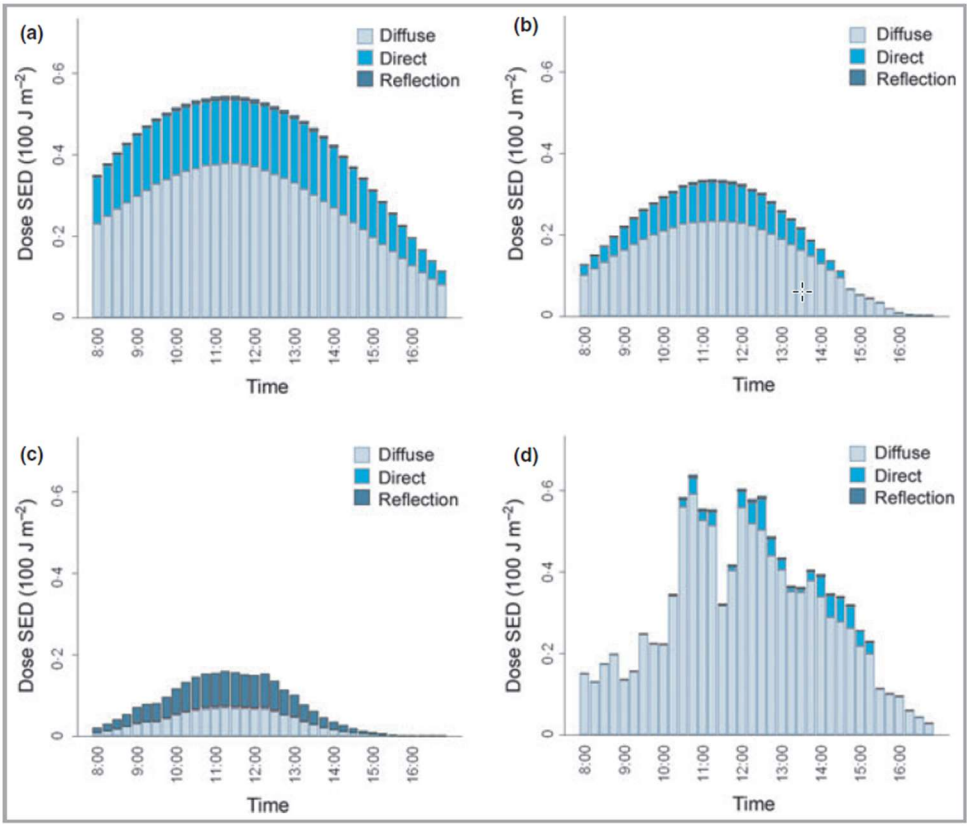
1) Wavelengths

A medical research laboratory wishes to install an MRI (Magnetic Resonance Imaging) for experimental purposes. The device emits a permanent main magnetic field of 1.5 Teslas (300 mT at the tunnel exit and 5 mT at the control console located in the control room). It also emits a radiation of 6 V/m at 42 MHz during the examination.

What risks should the laboratory manager think about (direct and indirect) when planning the layout of the room and the organization of the work?

2) Exposure profile

An exposure simulation was used to estimate the daily UV-erythemal dose to the face of a construction worker on 4 different (typical) days of the year.



a) What periods of the year and conditions correspond to Figures 1-4?
b) What are the chronic risks of such exposure?
c) Can you explain the reason for the small contribution of direct irradiation to the total dose?
d) What phenomena are responsible for the "reflected" exposure peaks in situation 3? What are the associated risks?

3) Summer Grill

What prevention messages would be appropriate to protect these workers from solar radiation (construction work on a concrete slab)?