

Name of research institute or organization:

**Section of Environmental Radioactivity, Radiation Protection
Division of the Swiss Federal Office of Public Health**

Title of project:

Aerosol Monitoring Station at the Jungfrauoch (RADAIR)

Project leader and team

Prof. H. Völkle, Section Head, Pierre Beuret, project responsible

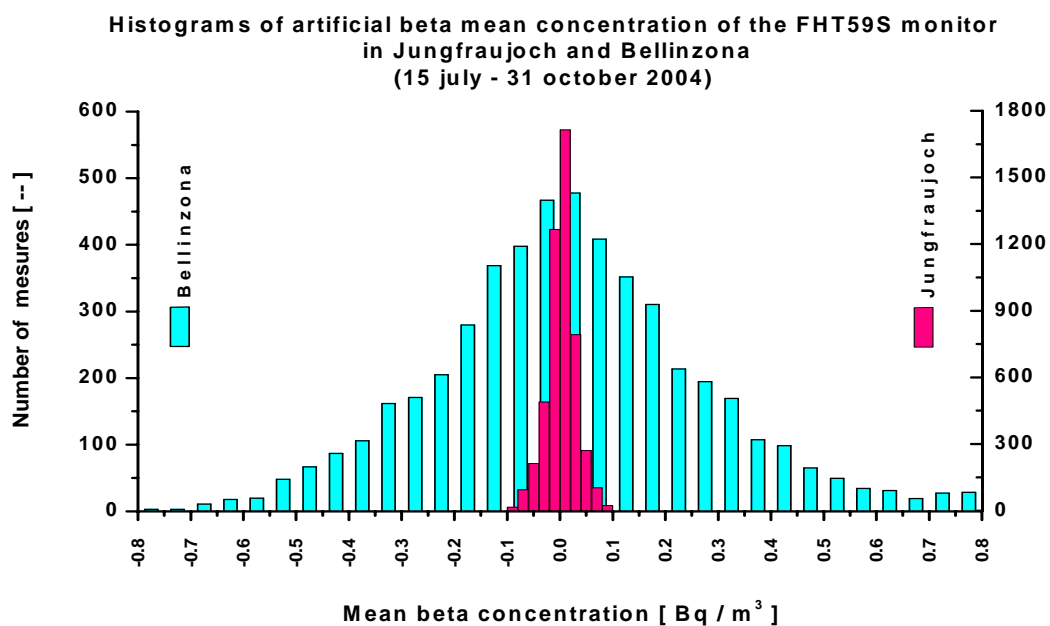
Project description:

The automatic aerosol radioactivity monitoring station FHT59S operated by the Swiss Federal Office of Public Health at Jungfrauoch has the following particular features:

- To detect rapidly any increase of air radioactivity at the altitude of 3400 m above sea level,
- A detection limit for artificial radioactivity of less than 0.1 Bq/m^3 - i.e. five times lower than on the Swiss Plateau - due to the very low Radon concentration this altitude.

Comments on the measurement of 2004:

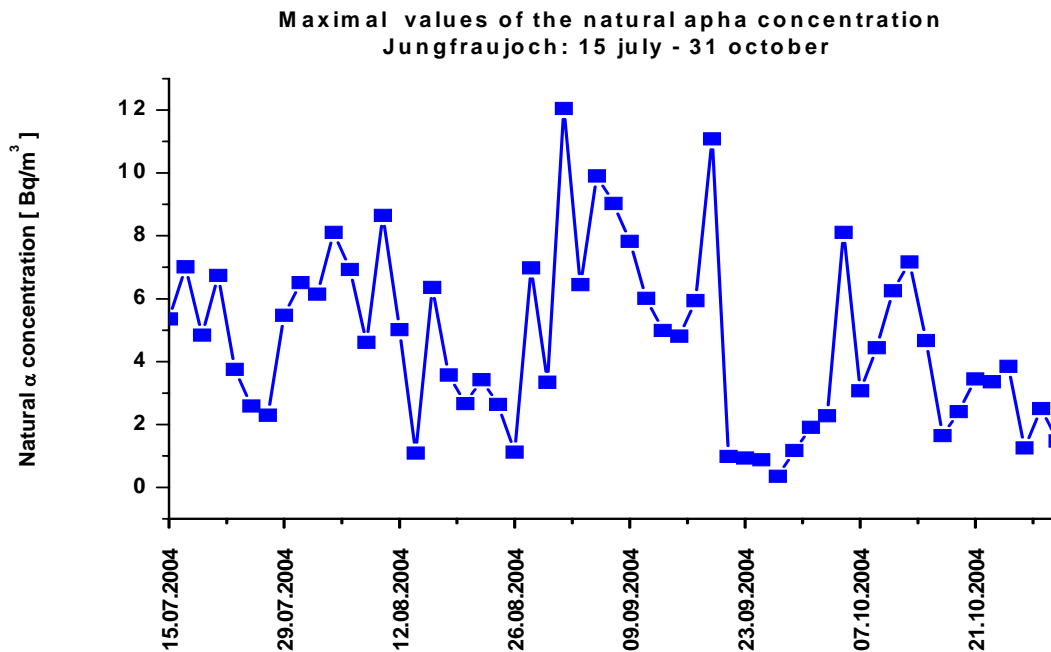
- Diagram 1 compares the detection limits between the aerosol monitor (FHT59S) at the Jungfrauoch and a similar instrument situated in Bellinzona (Tessin).
- A radioactive incident causing an increase of the artificial beta radioactivity in the atmosphere of 0.1 and 1 Bq/m^3 could therefore be detected at the Jungfrauoch, whereas this is not possible for a similar monitoring station situated on the Swiss Plateau.
- For normal situations, i.e. with no artificial radioactivity in the air, the calculated net Beta radioactivity at the Jungfrauoch, using the Alpha-Beta compensation technique (See below), is less than 0.1 Bq/m^3 . As shown in the histogram below during 2004 some 95 percent of the values were below 0.08 Bq/m^3 .



Graphic 1

The automatic α/β -compensation technique applied by our aerosol monitoring stations is based on the simultaneously measured gross Alpha (A_G) and gross Beta (B_G) radio-activity of the aerosols collected on the filter. The net (artificial) Beta radioactivity (B_N) is calculated by the following formula: $B_N = B_G - f \cdot A_G$. The constant factor f can be adapted either by the programme or by the operator.

Diagram 2 shows the contribution to the alpha radioactivity due to Radon daughters transported up to the Jungfraujoch during summer by air masses from the lowlands. During the period October 15 to July 31 maximal values were observed every 2 days.



Graphic 2

Comments on technical aspects:

Apart from some minor telecommunication and electric power troubles, there was no major breakdown at the aerosol monitor during 2004.

Key words:

Environmental Radioactivity Monitoring

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