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Laboratory measurements on Radon exposure effects on local environmental temperature: implications for satellite TIR measurements

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Surface latent heat flux (SLHF) is proportional to the heat released by phase changes during solidification or evaporation or melting. Effects of SLHF on earth's surface have also been measured by satellite techniques able to measure thermal infrared radiation (TIR). Recent studies found a possible correlation between SLHF and earthquakes thus satellite techniques are widely utilized in researches on the possible link between SLHF and earthquakes. Possible fluctuations on SLHF values during seismic periods have been attributed to different causes like the expulsion from the ground of greenhouse gases or by Radon. In particular ionization processes due to Radon decay could lead to changes in air temperature. Laboratory experiments have been carried out to highlight the possible role of Radon in thermal environmental conditions of a laboratory controlled atmospheric volume. Samples of highly radioactive granite powder containing 600 Bq/kg of Radium that is 20 times higher than the average continental lithosphere content has been stored in a desiccator
of 0,005 m3 volume for 30 days to accumulate radon 222Rn in the desiccator air. After radon accumulation the desiccator was placed inside a styrofoam chamber of 1x0.5x0.5 m size and the cover removed. The relative humidity of chamber air was 72% and temperature 24 oC. Experiment was monitored by an infrared camera Flir Therma CAM PM695 operating in the spectrum band 7,5-13 μm with thermal resolution 0,01ºC and a RadStar RS300-I Radon Detector/Monitor with 1 hour time resolution. Air temperature and humidity were monitored by a digital Terdens thermohygrometer. No significant thermal or humidity effects were observed.