Contribution ID: **5** Type: **Poster + 3 Minute Pitch**

Impact of wind action and medium physical properties on horizontal pore gas flow in near-surface porous media.

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Wind action at the soil surface potentially controls the movement of gases (including greenhouse gases and water vapor) in the near-surface soil as well as exchange of these gases with the atmosphere. Part of the mechanism behind this gas movement has recently been shown to be wind-induced horizontal pore gas movement within the near-surface soil.
The objective of this study was to investigate how these wind-induced horizontal pore gas velocities depend on near-surface wind speed, wind gustiness, soil gas permeability, and distance to the soil surface.
Velocity profiles for wind-induced, horizontal pore gas flow as a function of soil depth in the top 15 cm of the soil, were determined using a recently presented tracer tracking method for measuring wind-induced pore gas velocity profiles in porous media. Measurements were carried out using two dry, granular porous media for different combinations of wind speed, wind gust frequency and medium particle size, in a wind tunnel to assure controlled conditions. N2 was used as tracer gas. Media particle sizes were 1.18 –2.36 mm and 4.75 – 10 mm, exposed to wind speeds of up to 6 ms-1 and gust frequencies up to 1 Hz. Experiments were based on the 2k factorial design.
Results indicate, that average wind speed, wind gustiness and soil medium physical properties, all have a significant influence on both absolute horizontal pore gas velocities, as well as on the overall shape of the pore gas velocity profiles as a function of soil depth.

References

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