

EGU21-16566

<https://doi.org/10.5194/egusphere-egu21-16566>

EGU General Assembly 2021

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## Studying the transport and retention of naturally occurring microplastics (MPs) in sandy soils using column experiments

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In the 1950's, plastics were introduced as a miracle material and since then it has revolutionised human society in almost every domain of our daily life. The benefits of plastics are countless but their inherent resistance to degradation has ultimately led to their accumulation in the environment in the form of micro and nano plastics. In recent years, the presence of microplastics (MP) in fresh water sources has raised questions related to the protection of drinking water. In Austria, the exact status of groundwater contamination by MP is unknown. To understand the behaviour of MP that are present in the environment, a study was conducted to investigate the transport and distribution of MP in groundwater using column experiments.

Polyethylene MP were produced from 3D fluorescent printing material using a milling technique and in a well-defined size range of 1-200  $\mu\text{m}$ . A borosilicate glass column (1.5 cm diameter and 10 cm long) was used as our experimental setup. The columns were packed with quartz and coarse sand. A layer of homogenized MP-sand mixture (approximately 3 to 5% w/w) was applied at the top of a soil column. The transport behaviour of MP were analysed in terms of various physical and chemical factors like MP-concentration, soil particle size, inflow rate, ionic strength and straining effect. The outflow from the column was collected at different pore volume intervals and analysed for the presence of MP. The breakthrough curves (BTCs) were obtained by measuring the MP concentrations of the effluent.