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**Spatial Arrangement of Organic Compounds on a Model Mineral Surface: Implications for Soil Organic Matter Stabilization**[1] HAILE AMBAYE, LOUKAS PETRIDIS, ORNL, SINDHU JAGADAMMA, MICHAEL KILBEY, University of Tennessee, VALERIA LAUTER, BRADLEY LOKITZ, MELANIE MAYES, ORNL — Stability of organic carbon compounds in soil is important for global climate futures which could be affected by the complexity of the mineral-organic carbon interfaces. We examined the nanoscale structure of model interfaces by depositing films of organic carbon compounds of contrasting chemical character, hydrophilic glucose, deuterated-amphiphilic stearic acid (SA) and Natural Organic Matters (NOM) onto a soil mineral analogue ($Al_2O_3$). The NOM was separated into its constituent components such as NOM-Philic and NOM-Phobic when it is deposited onto the soil mineral. We used Neutron Reflectivity technique to understand the depth organization of the thin films. The result indicates that glucose molecules reside in a layer between $Al_2O_3$ and stearic acid and SA self-assembles. No self-assembly of SA was observed when SA and NOM-Phobic was deposited on the mineral soil. Molecular dynamics simulations reveal the thermodynamic driving force behind glucose partitioning on the mineral interface.

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