

Abstract Submitted
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Stick-slip friction and ageing in Velcro[®] LISA MARIANI, PAUL ANGIOLILLO, Saint Joseph's University — The mesoscopic hook and loop system of Velcro[®] provides a model of stick-slip friction that exhibits behavior reminiscent of results seen in nanoscale model systems. The friction is linearly dependent on contact area and independent of driving velocity. Moreover, there is a power law dependence of the friction on loading, with exponent between $1/4$ and $1/3$. Furthermore, the evolution of stick-slip to more smooth sliding, as controlled by contact area, is also noted. These transition predictions follow power law profiles, as well, with respect to increasing contact area. Thus, the hook-and-loop system shows to be a good mesoscale model system of stick-slip friction and provides a link between nanoscale and macroscale friction. Through an investigation into the ageing of the hooks in the system, the data suggests that the hooks age during the shearing regime and take a characteristic time to return to initial attachment strength. Additionally, there does not appear to be a significant affect of ageing on the kinetic friction experienced by the system.

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