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Anisotropic frictional heat dissipation in cyclotrimethylene trinitramine[1] PANKAJ RAJAK, RAJIV KALIA, AIICHIRO NAKANO, PRIYA VASHISHTA, Univ of Southern California — Anisotropic frictional response and corresponding heat dissipation from different crystallographic planes of RDX crystal is studied using molecular dynamics simulations. The effect of frictional force on the nature of damage and system temperature is monitored along different directions on primary slip plane, (010), of RDX and on non-slip planes, (100) and (001). The correlation between the friction coefficient, deformation and the frictional heating in these system is determined. It is observed that friction coefficients on slip planes are smaller than those of non-slip planes. In response to friction on slip plane, RDX crystal deforms via dislocation formation and shows less heating. On non-slip planes due to the inability of the system to deform by dislocation formation, large temperature rise is observed in the system just below the contact area of two surfaces. Frictional sliding on non-slip planes also lead to the formation of damage zone just below the contact area of two surfaces due to the change in RDX ring conformation from chair to boat/half-boat.

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Pankaj Rajak
Univ of Southern California

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