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Splashing on smooth and rough dry surfaces LEI XU, SIDNEY NAGEL, University of Chicago — In previous experiments, we studied the splash created when a drop of fluid hits a smooth dry surface and discovered that the pressure of the surrounding gas determines whether or not splashing will occur. We have now extended our studies to the case of a drop hitting a rough substrate. We systematically varied both the surface roughness and the pressure of the surrounding gas and found two distinct contributions to a splash. One is caused by air and has the same characteristics as the "coronal" splash observed on smooth substrates. A second, "prompt" splash, contribution is caused by surface roughness. We have also measured the size distribution of the droplets emitted from a splash. A broad distribution of droplet sizes is found at high gas pressures. As the gas pressure is lowered towards the splash/no-splash transition the distribution changes. At the threshold pressure, the distribution is strongly peaked at an average size.

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