Nori, Plourde, and Bretz Reply: Reference [1] deals with the (i) deposition, (ii) growth, (iii) coalescence, (iv) motion, and, especially, (v) avalanching of fluid droplets dripping off the edge of a sprayed surface, while the preceding Comment [2] only deals with a simple model of deposition, where droplets *neither coalesce, move, avalanche nor leave* the deposition surface. Thus [1] and [2] consider very *different* processes; so the simple *static* analysis presented in [2] does not apply to the highly interactive complex *dynamics* of avalanching and dripping [1]. For instance, moving droplets engulf stationary droplets in their path leaving wedge-shaped "cleared" regions (central to [1] and ignored in [2]), drastically changing the droplet size distribution on the sprayed surface. For a careful and systematic study of (i)–(iv), and especially (v), the reader is referred to Refs. [1,3] and the many references therein.

Unfortunately, the notation used in [2] is misleading because what [2] calls the droplet size S is *not* the measured S used in [1] (which involved droplets moving, coalescing, and avalanching). This invalidates the comparison between their Fig. 1 (for nonmoving, noncoalescing, and nondripping droplets) and our Fig. 2, and also the comparison of their special number $-\frac{8}{3}$, which is close to one of the *several* exponents obtained in [1]. No special emphasis on this number exists in [1] because our exponents are only linear fits to data. Furthermore, some of the results shown and discussed in [1] have *no* power law dependence at all. Finally, numerical agreement between different constants can lead to misleading conclusions (see, e.g., [4]).

We analyzed the statistics of water droplet avalanches in a continuously driven system [1]. Distributions were obtained for avalanche (a) size, (b) lifetime, and (c) time between successive avalanches, along with (d) power spectra and (e) return maps. We observed a variety of behaviors for the size and lifetime distribution of water droplet avalanches, *ranging from power law,* for low flow rates and different water viscosities, *to exponential behavior with characteristic scales,* for high flow rates. Like (ii)–(v) above, the preceding Comment [2] also ignores items (b)–(e), and does not obtain the wide variety of behavior obtained in [1] using the very *same geometry.* Moreover, our results strongly depend on the flow rate and water viscosity, while the simple geometrical argument (focused only on *nonmobile* droplets) in [2] does not have an explicit tunable flow or viscosity dependence.

The obvious effect of geometry on the distribution of avalanche sizes $D(S)$ can be simply and convincingly seen by first considering the limiting case of a faucet dripping a single narrow line of drops. Here $D(S)$ is a delta function $\delta(S-1)$, since all avalanches have equal size. Because of the purely geometrical constraint of a very narrow dripping or "take-off" region, large avalanches are impossible. This argument can be extended to a sprayed window pane. Spraying over a small region of an inclined flat surface would also produce a narrow distribution of avalanche sizes, since the dripping region would be small. Spraying over a very large region on an inclined flat surface (e.g., by using either *many* spray misters or long horizontal dripping handrails [5]) would produce a large dripping region that would allow, in principle, the possibility of large avalanches. This configuration, not studied in [1,2], simulates a drizzle on a roof or window pane.

For simplicity, we used a single spray mister whose axially symmetric geometry provided good spray uniformity. Also, a dome maximized the dripping, or take-off region, thus allowing the possibility of having large avalanches. *For a fixed geometry,* [1] systematically studied how fluid droplets *that move, coalesce, and drip* could have avalanche distributions *ranging from very narrow to very broad* as a function of several physical parameters.

Franco Nori,[1] Britton Plourde,[2] and Michael Bretz[1]
[1]Department of Physics
University of Michigan
Ann Arbor, Michigan 48109-1120

[2]Department of Physics
University of Illinois
Urbana, Illinois 61801

Received 19 September 1994
PACS numbers: 64.60.Ht, 05.40.+j, 05.70.Ln

[1] B. Plourde, F. Nori, and M. Bretz, Phys. Rev. Lett. **71**, 2749 (1993).
[2] C.-h. Liu and H. M. Jaeger, preceding Comment, Phys. Rev. Lett. **74**, 3497 (1995).
[3] P. Meakin, Rep. Prog. Phys. **55**, 157 (1992); Z. Cheng, S. Redner, P. Meakin, and F. Family, Phys. Rev. A **40**, 5922 (1989); T. Vicsek and F. Family, Phys. Rev. Lett. **52**, 1669 (1984); F. Family, P. Meakin, and J. M. Deutch, *ibid.* **57**, 727 (1986); Q. Zheng, H. Guo, and J. D. Gunton, Phys. Rev. A **39**, 3181 (1989).
[4] D. J. Gross, Phys. Today **42**, No. 12, 9 (1989).
[5] J. P. Crutchfield and K. Kaneko, Phys. Rev. Lett. **60**, 2715 (1988); J. D. Scargle *et al.,* Astrophys J. **411**, L91 (1993).

0031-9007/95/74(17)/3498(1)$06.00