Rubio, Dougherty, and Gollub Reply: In the preceding Comment[1] Horvath, Family, and Vicsek (HFV) report results on experiments suggested to be similar to the ones described in our paper,[2] and compare them with their own reanalysis of our data in Fig. 1 of Ref. 2. They find that the value of the roughness exponent in their experiment is $\beta = 0.88 \pm 0.08$, in agreement with the value obtained by reanalyzing the interfaces in our paper, $\beta = 0.91 \pm 0.08$. Both of these values differ from our reported result of $\beta = 0.73 \pm 0.03$. They conclude that this discrepancy is particularly important "because it is expected to be relevant from the point of view of universality classes of surface growth phenomena."

Because of space limitations, we did not report all of the checks we have made on our roughness calculations, although some have been published elsewhere.[3] As stated in Ref. 2, we also checked our results against direct computations of the box and divider dimensions, and obtained good agreement. Furthermore, we checked all three algorithms on self-affine Weierstrass-Mandelbrot curves for a wide range of roughness exponents. Therefore, we are confident that the results reported in our paper are correct.

The discrepancy between our result and that obtained in the reanalysis of our data by HFV is probably due to the process they used to obtain the data. This process included the plotting of the interfaces with a pen of finite width, the printing of the figure, and the redigitization of the data with 740×600 resolution. The first two processes smooth the interfaces on length scales smaller than the actual thickness of the lines in the final printed figure. The final stage involves digitizing the interfaces with higher spatial resolution (in the horizontal direction) than that of the original data.

In a system with scaling behavior over many decades, this process should introduce a crossover from rough interfaces at large length scales to smooth ones at smaller scales. In our system, though, where the scaling range is somewhat limited, it is not surprising that the result is simply a higher apparent roughness exponent. Indeed, their "reanalyzed" data do not exhibit as clear a scaling range as the original data. We have checked this hypothesis quantitatively by taking the original data representing the interfaces reported in Fig. 1 of Ref. 2, and processing it in a way that corresponds approximately to that used in Ref. 1. The value obtained for the resulting interfaces was $\beta = 0.84 \pm 0.04$, distinctly higher than the correct value we reported. Variations in the details of the interface-finding algorithm might also have some effect. We conclude that a large part of the difference is simply an artifact resulting from the fact that they did not have access to the original data. Thus their reanalysis has little relevance either to our data or to their experimental value.

Without additional experimental details, it is difficult to make direct comparisons between our work and the experiments mentioned in the Comment. While the exponent obtained in our work is reproducible and independent of capillary number and bead size, it could depend on other factors, such as the wetting properties of the beads and the plates or the packing of the beads. These factors could affect the noise properties of the system and may lead to different exponents. However, no systematic study of these effects has yet been reported. In any case, the results of the two experiments differ by less than 2 of their standard deviations, so the difference may not be significant.

We believe that HFV have misstated the conclusions in our paper. We did not conclude that our value of β "might represent a characteristic value for a class of surface growth process." In fact, our only reference to surface growth models was to the work of Medina *et al.*,[4] which may not be directly applicable to interfacial motion in porous media, and it yields nonuniversal roughness exponents that depend on the properties of the noise.

In summary, we believe that our reported results are correct. As HFV imply, the degree to which our experiments might be generalized to other circumstances merits further exploration. Most importantly, the basic physics controlling the shapes of interfaces in porous media is still imperfectly understood.

This work was supported by National Science Foundation Low Temperature Physics Grant No. DMR-890-1869.

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Received 9 January 1990
PACS numbers: 47.55.Mh, 68.45.Gd

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