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Detailed model of bouncing drops on a bounded, vibrated bath

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— We present a detailed model of drops bouncing on a bounded vibrated bath. These drops are known to bounce indefinitely and to exhibit complex and varied vertical dynamics depending on the acceleration of the bath. In addition, in a narrow parameter regime, these drops travel horizontally while being guided by the waves they generate. Our model tracks the drop's vertical radius and position, as well as the eigenmodes of the waves generated via ordinary differential equations only. We accurately capture the vertical dynamics, as well as some of the horizontal dynamics. Our model may be extended to account for interactions with other drops or obstacles, such as slits and corrals.

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