"Shaken, not Stirred": Vortical Martini by Linear Sloshing

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When James Bond orders his classic Vesper martini, insisting it be "Shaken, not stirred," no skilled bartender would contemplate shaking the actual glass, but rather their cocktail shaker. But what if we indulge our curiosity and shake the liquid within the martini glass itself? We conducted a series of experiments to set conical containers in periodic linear oscillations, inducing complex vortical flows, and producing beautiful patterns within the drink. For instance, gently shaking the martini glass from side to side (directions indicated by the arrowheads) results in the formation of counter jets and stagnant flows confined in the glass, creating circulation cells. By adding a dash of green food coloring, you can visualize a vibrant four-leaf clover, adding an enchanting touch to your St. Patrick's Day drink.

The swirling colors transform an ordinary drink into a spectacle, suitable for any occasion, and a basis for a new form of 'mixology'. The Reynolds number is a precise control knob for the patterns and regimes: dial it up, and you'll witness the turbulence of young love in your glass (top left); dial it down a little, sometimes creeping flow zigzags into triangles on a round free surface, forming the silhouette of phantoms for Halloween, and sometimes you will unveil a skewed quadrupole reminiscent of Christmas candy. Finally, at the lowest setting, we reveal a perfect quadrupole clover (bottom right).

Here are some tips for all the prospective mixologists: a shallow martini glass (the shape of the container matters), a collection of food dye and pearl dust for good visualization, no olives or orange peels to disturb the flow, and a little syrup in the drink, for example, to vary the Reynolds number. Most importantly, the glass should be gently shaken - not stirred. Cheers!