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From bubble bursting to droplet evaporation in the context of champagne aerosols THOMAS SEON, CNRS, Institut d'Alembert, Paris, ELISABETH GHABACHE, Institut d'Alembert, Paris, ARNAUD ANTKOWIAK, Institut d'Alembert, UPMC, Paris, GERARD LIGER-BELAIR, Universite de Reims Champagne-Ardenne, France — As champagne or sparkling wine is poured into a glass, a myriad of ascending bubbles collapse and therefore radiate a multitude of tiny droplets above the free surface into the form of very characteristic and refreshing aerosols. Because these aerosols have been found to hold the organoleptic essence of champagne they are believed to play a crucial role in the flavor release in comparison with that from a flat wine for example. Based on the model experiment of a single bubble bursting in idealized champagnes, the velocity, radius and maximum height of the first jet drop following bubble collapse have been characterized, with varying bubble size and liquid properties in the context of champagne aerosols. Using the experimental results and simple theoretical models for drop and surface evaporation, we show that bubble bursting aerosols drastically enhance the transfer of liquid in the atmosphere with respect to a flat liquid surface. Contrary to popular opinion, we exhibit that small bubbles are negative in terms of aroma release, and we underline bubble radii enabling to optimize the droplet height and evaporation in the whole range of champagne properties. These results pave the road to the fine tuning of champagne aroma diffusion, a major issue of the sparkling wine industry.

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