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**Formation of dynamic coherent structures by an ensemble of rigid particles** DENIS MELNIKOV, DMITRI PUSHKIN, VALENTINA SHEVTSOVA, Microgravity Research Center, Free University of Brussels (ULB), Belgium — We report numerical studies of the surprising effect of formation of coherent particulate structures in the thermocapillary liquid bridge flow. The studied regimes of the flow are characterized by a hydrothermal wave travelling in the azimuthal direction. Although formation of those structures was discovered experimentally more than a decade ago, until now it has remained unexplained and was not reproduced numerically in physically realistic regimes. The particles are small (with Stokes number of the order of  $10^{-6}$ ) and non-obtrusive. Usually such particles are expected to follow the flow. However, under certain conditions they create stable coherent structures. Those structures are dynamic and rotate azimuthally together with the travelling wave. The results reported are counterparts of our theoretical study of the physical mechanism leading to the formation of particulate coherent structures.

Valentina Shevtsova  
Microgravity Research Center, Free University of Brussels (ULB), Belgium

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