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**Drainage of the air film during drop impact on flowing liquid films**[1] ZHIZHAO CHE, OMAR MATAR, Imperial College London — Immediately upon the impact of a droplet on a liquid or a solid, a thin air cushion is formed by trapping air beneath the droplet. The drainage of the air film is critical in determining the eventual outcome of the impact. Here we propose a model to study the drainage of the gas film between a droplet and a flowing liquid film. The effects of a wide range of parameters influencing the drainage process are studied, such as the fluid viscosities, the surface tension, the velocity of the droplet, the velocity of the liquid film. The results show that the tangential movement of the liquid film can delay the drainage of the air film and promote the bouncing of droplets. This confirms our previous experimental results, which show that during the impact of droplets on flow liquid films, the probability of bouncing increases with the Reynolds number of the liquid film.

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