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IN BRIEF 2 August 2017

Maths explains how bees can stay airborne with such tiny wings

A BEE shouldn't be able to fly, maths insists. Its tiny wings shouldn't create enough lift to get its big body off the ground.

But now a new mathematical analysis has figured out how bees do it (*Journal of the Royal Society Interface*, doi.org/b92q).

Until the 1990s, bees were assumed to fly like planes, using airflow over their wings to create lift – but the sums didn't work. Then in 1996, it was found that tiny, tornado-like airflows called LEVs form on the leading edges of their wings. These were thought to provide the extra lift required.

But Mostafa Nabawy and William Crowther, both at the University of Manchester, UK, have now shown that LEVs don't directly add lift. By creating three mathematical models with different lift mechanisms and comparing them with experiments on eight different bee species, they found that LEVs simply let a bee angle each wing more sharply to the sky, improving the airflow over them.

If the LEVs stop, the pressure difference between the top and the underside of the wing that creates lift would drop, and the bee would fall from the air.

This article appeared in print under the headline “Maths solves flight of the bumblebee”

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