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Antimatter matters: the first decade and the next decade of the Large Hadron Collider beauty experiment

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The Large Hadron Collider beauty (LHCb) collaboration builds and operates one of the four large experiments at the LHC. We have published over 600 scientific papers in our first decade of operations. We have discovered differences in the behaviour of matter and antimatter in three new systems and studied particles that can oscillate into their own antiparticles. We have found over fifty new particles, including exotic particles containing four or five quarks. By the quirks of quantum mechanics, we are searching for new fundamental physics at energies higher than those of the LHC beams. We have recently installed our new detector upgrading the technology to allow us to further our studies, taking ten times more data and operating for the next decade. Highlights of the science programme and of the new detector system will be described.

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