

Department of Physics

Particle Physics
The Denys Wilkinson Building, Keble Road, Oxford OX1 3RH



Experimental Particle Physics Seminar

at 2.15 pm
Dennis Sciama Lecture Theatre

Tuesday 21st May 2019

Dr Nathan Jurik
University of Oxford

Recent LHCb pentaquark results

Abstract

In studies of the decay of the Λ_b baryon to the $J/\psi p K^-$ final state, LHCb was met with a surprise: the presence of a peaking structure in the $J/\psi p$ invariant mass distribution. If due to an intermediate resonance in the decay, the minimum quark content of $c\bar{c}uud$ would indicate the existence of the previously undetected class of hadrons called pentaquarks. Indeed, an amplitude analysis of the Run 1 dataset required two such candidates in order to describe the data. With the addition of Run 2 data and a re-optimisation of the selection, the increase in statistics has revealed more surprises in this decay mode. A new, narrow peak has appeared in the $J/\psi p$ system, and one of the previous peaks has been resolved into two separate structures. In this talk, the new results will be presented along with a discussion on their possible interpretations and outlook for future studies.