



Contribution ID: 221

Type: **Talk**

The Lambda 1405 is an anti-kaon–nucleon molecule

Tuesday, 24 June 2014 16:50 (20 minutes)

For almost 50 years the structure of the Lambda(1405) resonance has been a mystery for particle physicists. Even though it contains a heavy strange quark and has odd parity its mass is lower than any other excited spin-1/2 baryon. Before the existence of quarks was confirmed, Dalitz and co-workers speculated that it might be a molecular state of an anti-kaon bound to a nucleon. Although the intervening years have seen considerable effort, there has been no convincing resolution. Here we demonstrate that a new lattice QCD simulation showing that its strange magnetic form factor vanishes, together with a comprehensive Hamiltonian effective field theory analysis of the lattice QCD energy levels, unambiguously establishes that the structure is dominated by a bound anti-kaon–nucleon component. This result clarifies that not all states occurring in Nature can be described within a simple quark model framework and establishes the existence of exotic molecular meson-nucleon bound states

Primary author: Prof. LEINWEBER, Derek (University of Adelaide)

Co-authors: Prof. THOMAS, Anthony (University of Adelaide); Mr MENADUE, Ben (University of Adelaide); Mr OWEN, Benjamin (University of Adelaide); Dr HALL, Jonathan (University of Adelaide); Dr YOUNG, Ross (University of Adelaide); Dr KAMLEH, Waseem (University of Adelaide)

Presenter: Prof. LEINWEBER, Derek (University of Adelaide)

Session Classification: Hadron spectroscopy and interaction

Track Classification: Hadron Spectroscopy and Interactions