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The GlueX Project at Jefferson Lab

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One of the main scientific questions that remains unanswered in subatomic physics is the nature and behaviour of the "Glue" which holds the quarks together. The puzzling feature of this construction is that quarks are never found free, but only in triplets or pairs, a phenomenon known as "confinement". Since gluons carry colour charge, they can form chromoelectric flux tubes, which may result in unusual objects, such as glue-balls or hybrid combinations of gluons and quarks. In certain models, the later can be produced with quantum numbers not allowed in the simple quark picture. An international experiment (GlueX) at Jefferson Lab, Virginia, is being designed to search for such exotic hybrid mesons and thus elucidate the phenomenon of confinement. GlueX is considered a 'discovery' experiment; its salient features, the planned methodology of partial-wave analysis, and the R&D progress of its detector subsystems will be presented.

Primary authors : PAPANDREOU, Zisis (University of Regina (Canada))

Co-authors :

Presenter : PAPANDREOU, Zisis (University of Regina (Canada))

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