Partial wave analysis of the $\eta'\pi^-$ system for the reaction $\pi^- p \to \eta'\pi^- p$ at 18 GeV/c [1]

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States with spin (J), parity (P), and charge conjugation (C) $\mathrm{J^{PC}} = 0^{+-}, 0^{--}, 1^{-+}, 2^{+-}, \ldots$ are not allowed for a $q\overline{q}$ system and are thus manifestly "exotic". One purpose of the E852 experiment at Brookhaven National Laboratory is to investigate the mesonic spectrum for states with exotic quantum numbers. At present there is a controversy about the presence of a $J^{PC} = 1^{-+}$ wave in the $\pi^o\eta$ and $\pi^-\eta$ systems [2, 3]. Since the η and the η' have identical quantum numbers but different quark content, an investigation of the $\pi^-\eta'$ system is expected to be very useful in understanding the properties of any exotic state observed to decay into the $\pi\eta$ final state. A partial wave analysis has been performed on approximately 5,000 $\pi^-\eta'$ events taken during the 1994 run of E852. A clear forward-backward asymmetry in $cos\theta_{GJ}$ has been observed, indicating interference between odd and even waves. A partial wave analysis will be presented.

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[2]D. Alde et al. *Physics Letters B205*, 397(1988)
[3]H. Aoyagi et al. *Physics Letters B314*, 246(1993)