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

T. Adams[g], J. M. Bishop[g], N. M. Cason[g], J. M. LoSecco[g], J. J. Manak[g], A. H. Sanjari[g], W. D. Shephard[g], D. L. Stienike[g], S. A. Taegar[g], D. R. Thompson[g], S. U. Chung[a], R. W. Hackenburg[a], C. Olchanski[a], D. P. Weygand[a], H. J. Willutzki[a], S. Denisov[b], A. Dushkin[b], V. Kochetkov[b], I. Shein[b], A. Soldatov[b], B. B. Brabson[c], R. R. Crittenden[c], A. R. Dzierba[c], J. Gunter[c], R. Lindenbusch[c], D. R. Rust[c], E. Scott[c], P. T. Smith[c], T. Sulanke[c], S. Teige[c], Z. Bar-Yam[d], J. P. Cummings[d], J. P. Dowd[d], P. Eugenio[d], M. Hayek[d], W. Kern[d], E. King[d], E. V. Anoshina[e], V. A. Bodyagin[e], A. M. Gribushin[e], O. L. Kodolova[e], V. L. Korotkikh[e], M. A. Kostin[e], A. I. Ostrovidov[e], L. I. Sarycheva[e], N. B. Sinev[e], I. N. Vardanyan[e], A. A. Yershov[e], D. S. Brown[f], T. K. Pedlar[f], K. K. Seth[f], J. Wise[f], D. Zhao[f], G. S. Adams[h], J. Napolitano[h], M. Nozar[h], J. A. Smith[h], M. Witkowski[h]

[a]Brookhaven, [b]IHEP Protvino, [c]Indiana, [d]Massachusetts Dartmouth, [e]Moscow State, [f]Northwestern, [g]Notre Dame, [h]Rensselaer Collaboration

Presented by D.R. THOMPSON, University of Notre Dame, for the E852 Collaboration

A partial wave analysis has been performed on some 213,000 $\eta\pi^-$ events (by far the largest analyzed sample to date). These results can be compared to previous analyses by the GAMS[2] and KEK[3] collaborations. This system is of particular interest because an $\eta\pi^-$ state in a relative P-wave has quantum numbers $J^{PC} = 1^{-+}$. These values are not allowed for a $q\bar{q}$ bound state. Thus observation of an $\eta\pi^-$ P-wave resonance would constitute unambiguous evidence of an exotic meson. Such a state could interfere with the dominant $a_2(1320)$ produced in our data. We do observe a clear forward-backward asymmetry in $cos\theta_{GJ}$, indicating the presence of interference between odd and even waves. Results of the partial wave analysis will be presented.

[1]Work supported in part by the Department of Energy and the National Science Foundation.
[2]D. Alde et al., *Physics Letters B205*, 397(1988)
[3]H. Aoyagi et al., *Physics Letters B314*, 246(1993)