$\Xi(1690)$

$I(J^P) = \frac{1}{2}(?^?)$ Status: $*{*}*$

DIONISI 78 sees a threshold enhancement in both the neutral and negatively charged $\Sigma\overline{K}$ mass spectra in $K^- p \rightarrow (\Sigma\overline{K})K\pi$ at 4.2 GeV/c. The data from the $\Sigma\overline{K}$ channels alone cannot distinguish between a resonance and a large scattering length. Weaker evidence at the same mass is seen in the corresponding $\Lambda\overline{K}$ channels, and a coupled-channel analysis yields results consistent with a new Ξ.

BIAGI 81 sees an enhancement at 1700 MeV in the diffractively produced ΛK^- system. A peak is also observed in the $\Lambda\overline{K}^0$ mass spectrum at 1660 MeV that is consistent with a 1720 MeV resonance decaying to $\Sigma^0\overline{K}^0$, with the γ from the Σ^0 decay not detected.

BIAGI 87 provides further confirmation of this state in diffractive dissociation of Ξ^- into ΛK^-. The significance claimed is 6.7 standard deviations.

ADAMOVICH 98 sees a peak of 1400 $\pm$ 300 events in the $\Xi^-\pi^+$ spectrum produced by 345 GeV/c Σ^--nucleus interactions.

$\Xi(1690)$ MASSES

MIXED CHARGES

VALUE (MeV)	*DOCUMENT ID*
1690$\pm$10 OUR ESTIMATE	

This is only an educated guess; the error given is larger than the error on the average of the published values.

$\Xi(1690)^0$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1686$\pm$4	1400	ADAMOVICH	98	WA89	Σ^- nucleus, 345 GeV/c
1699$\pm$5	175	[1] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c
1684$\pm$5	183	[2] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Xi(1690)^-$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1691.1$\pm$ 1.9$\pm$2.0	104	BIAGI	87	SPEC	Ξ^- Be 116 GeV
1700 $\pm$10	150	[3] BIAGI	81	SPEC	Ξ^- H 100, 135 GeV
1694 $\pm$ 6	45	[4] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Xi(1690)$ WIDTHS

MIXED CHARGES

VALUE (MeV)	*DOCUMENT ID*
<30 OUR ESTIMATE	

$\Xi(1690)^0$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
10± 6	1400	ADAMOVICH	98	WA89	Σ^- nucleus, 345 GeV/c
44±23	175	[1] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c
20± 4	183	[2] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Xi(1690)^-$ WIDTH

VALUE (MeV)	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
< 8	90	104	BIAGI	87	SPEC	Ξ^- Be 116 GeV
47±14		150	[3] BIAGI	81	SPEC	Ξ^- H 100, 135 GeV
26± 6		45	[4] DIONISI	78	HBC	$K^- p$ 4.2 GeV/c

$\Xi(1690)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\Lambda \overline{K}$	seen
Γ_2	$\Sigma \overline{K}$	seen
Γ_3	$\Xi \pi$	seen
Γ_4	$\Xi^- \pi^+ \pi^0$	
Γ_5	$\Xi^- \pi^+ \pi^-$	possibly seen
Γ_6	$\Xi(1530) \pi$	

$\Xi(1690)$ BRANCHING RATIOS

$\Gamma(\Lambda \overline{K})/\Gamma_{total}$ — Γ_1/Γ

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
seen	104	BIAGI	87	SPEC	−	Ξ^- Be 116 GeV

$\Gamma(\Sigma \overline{K})/\Gamma(\Lambda \overline{K})$ — Γ_2/Γ_1

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
0.75±0.39	75	ABE	02C	BELL		$e^+ e^- \approx \Upsilon(4S)$
2.7 ±0.9		DIONISI	78	HBC	0	$K^- p$ 4.2 GeV/c
3.1 ±1.4		DIONISI	78	HBC	−	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi \pi)/\Gamma(\Sigma \overline{K})$ — Γ_3/Γ_2

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
<0.09	DIONISI	78	HBC	0	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi \pi)/\Gamma_{total}$ — Γ_3/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
seen	ADAMOVICH	98	WA89	Σ^- nucleus, 345 GeV/c

$\Gamma(\Xi^- \pi^+ \pi^0)/\Gamma(\Sigma \overline{K})$ — Γ_4/Γ_2

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
<0.04	DIONISI	78	HBC	0	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi^- \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
possibly seen	4	BIAGI	87	SPEC	−	Ξ^- Be 116 GeV

$\Gamma(\Xi^- \pi^+ \pi^-)/\Gamma(\Sigma \overline{K})$ Γ_5/Γ_2

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
$<$0.03	DIONISI	78	HBC	−	$K^- p$ 4.2 GeV/c

$\Gamma(\Xi(1530)\pi)/\Gamma(\Sigma \overline{K})$ Γ_6/Γ_2

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
$<$0.06	DIONISI	78	HBC	−	$K^- p$ 4.2 GeV/c

$\Xi(1690)$ FOOTNOTES

[1] From a fit to the $\Sigma^+ K^-$ spectrum.
[2] From a coupled-channel analysis of the $\Sigma^+ K^-$ and $\Lambda \overline{K}^0$ spectra.
[3] A fit to the inclusive spectrum from $\Xi^- N \rightarrow \Lambda K^- X$.
[4] From a coupled-channel analysis of the $\Sigma^0 K^-$ and ΛK^- spectra.

$\Xi(1690)$ REFERENCES

ABE	02C	PL B524 33	K. Abe *et al.*	(KEK BELLE Collab.)
ADAMOVICH	98	EPJ C5 621	M.I. Adamovich *et al.*	(CERN WA89 Collab.)
BIAGI	87	ZPHY C34 15	S.F. Biagi *et al.*	(BRIS, CERN, GEVA+) I
BIAGI	81	ZPHY C9 305	S.F. Biagi *et al.*	(BRIS, CAVE, GEVA+)
DIONISI	78	PL 80B 145	C. Dionisi *et al.*	(CERN, AMST, NIJM+) I