Reference = BOGOLYUBSKY 13; PAN 76 1324
Verifier code = KHARLOV

Normally we send all verifications for one experiment to one person, usually the spokesperson or data-analysis co-ordinator, who then distributes them to the appropriate people. Please tell us if we should send the verifications for your experiment to someone else.

*PLEASE READ NOW*

*PLEASE REPLY WITHIN ONE WEEK*

Yuri Kharlov

EMAIL: yuri.kharlov@ihep.ru

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July 21, 2016

Dear Colleague,

(1) Please check the results of your experiment carefully. They are marked.

(2) Please reply within one week.

(3) Please reply even if everything is correct.

(4) IMPORTANT!! Please tell WHICH papers you are verifying. We have lots of requests out.

(5) Feel free to make comments on our treatment of any of the results (not just yours) you see.

Thank you for helping us make the Review accurate and useful.

Sincerely,

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# LIGHT UNFLAVORED MESONS ($S = C = B = 0$)

NODE=MXXX005

For $I = 1$ ($\pi$, $b$, $\rho$, $a$): $u\overline{d}$, $(u\overline{u}-d\overline{d})/\sqrt{2}$, $d\overline{u}$;
for $I = 0$ ($\eta$, $\eta'$, $h$, $h'$, $\omega$, $\phi$, $f$, $f'$): $c_1(u\overline{u} + d\overline{d}) + c_2(s\overline{s})$

NODE=MXXX005

NODE=M005

## $f_2(1270)$

$I^G(J^{PC}) = 0^+(2^{++})$

### $f_2(1270)$ MASS

NODE=M005M

NODE=M005M

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **1275.5± 0.8 OUR AVERAGE** | | | | | |
| YOUR DATA 1275.8± 1.0±0.4 | | [1] BOGOLYUB... | 13 | SPEC | $7\pi^+(K^+,p)A \to n\gamma + X$ |
| 1262 $^{+\ 1}_{-\ 2}$ ±8 | | ABLIKIM | 06V | BES2 | $e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$ |
| 1275 ±15 | | ABLIKIM | 05 | BES2 | $J/\psi \to \phi\pi^+\pi^-$ |
| 1283 ± 5 | | ALDE | 98 | GAM4 | 100 $\pi^- p \to \pi^0\pi^0 n$ |
| 1278 ± 5 | | [2] BERTIN | 97C | OBLX | 0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$ |
| 1272 ± 8 | 200k | PROKOSHKIN | 94 | GAM2 | 38 $\pi^- p \to \pi^0\pi^0 n$ |
| 1269.7± 5.2 | 5730 | AUGUSTIN | 89 | DM2 | $e^+e^- \to 5\pi$ |
| 1283 ± 8 | 400 | [3] ALDE | 87 | GAM4 | 100 $\pi^- p \to 4\pi^0 n$ |
| 1274 ± 5 | | [3] AUGUSTIN | 87 | DM2 | $J/\psi \to \gamma\pi^+\pi^-$ |
| 1283 ± 6 | | [4] LONGACRE | 86 | MPS | 22 $\pi^- p \to n2K^0_S$ |
| 1276 ± 7 | | COURAU | 84 | DLCO | $e^+e^- \to e^+e^-\pi^+\pi^-$ |
| 1273.3± 2.3 | | [5] CHABAUD | 83 | ASPK | 17 $\pi^- p$ polarized |
| 1280 ± 4 | | [6] CASON | 82 | STRC | 8 $\pi^+ p \to \Delta^{++}\pi^0\pi^0$ |
| 1281 ± 7 | 11600 | GIDAL | 81 | MRK2 | $J/\psi$ decay |
| 1282 ± 5 | | [7] CORDEN | 79 | OMEG | 12–15 $\pi^- p \to n2\pi$ |
| 1269 ± 4 | 10k | APEL | 75 | NICE | 40 $\pi^- p \to n2\pi^0$ |
| 1272 ± 4 | 4600 | ENGLER | 74 | DBC | 6 $\pi^+ n \to \pi^+\pi^- p$ |
| 1277 ± 4 | 5300 | FLATTE | 71 | HBC | 7.0 $\pi^+ p$ |
| 1273 ± 8 | | [3] STUNTEBECK | 70 | HBC | 8 $\pi^- p$, 5.4 $\pi^+ d$ |
| 1265 ± 8 | | BOESEBECK | 68 | HBC | 8 $\pi^+ p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 1259 ± 4 ±4 | 1.7k | [8,9] DOBBS | 15 | | $J/\psi \to \gamma\pi^+\pi^-$ |
| 1267 ± 4 ±3 | 1.5k | [8,9] DOBBS | 15 | | $\psi(2S) \to \gamma\pi^+\pi^-$ OCCUR=2 |
| 1270 ± 8 | | [10] ANISOVICH | 09 | RVUE | 0.0 $\overline{p}p$, $\pi N$ |
| 1277 ± 6 | 870 | [11] SCHEGELSKY | 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |
| 1251 ±10 | | TIKHOMIROV | 03 | SPEC | 40.0 $\pi^-$ C $\to K^0_S K^0_S K^0_L$ X |
| 1260 ±10 | | [12] ALDE | 97 | GAM2 | 450 $pp \to pp\pi^0\pi^0$ |
| 1278 ± 6 | | [12] GRYGOREV | 96 | SPEC | 40 $\pi^- N \to K^0_S K^0_S$ X |
| 1262 ±11 | | AGUILAR-... | 91 | EHS | 400 $pp$ |
| 1275 ±10 | | AKER | 91 | CBAR | 0.0 $\overline{p}p \to 3\pi^0$ |
| 1220 ±10 | | BREAKSTONE | 90 | SFM | $pp \to pp\pi^+\pi^-$ |
| 1288 ±12 | | ABACHI | 86B | HRS | $e^+e^- \to \pi^+\pi^-$ X |
| 1284 ±30 | 3k | BINON | 83 | GAM2 | 38 $\pi^- p \to n2\eta$ |
| 1280 ±20 | 3k | APEL | 82 | CNTR | 25 $\pi^- p \to n2\pi^0$ |
| 1284 ±10 | 16000 | DEUTSCH... | 76 | HBC | 16 $\pi^+ p$ |
| 1258 ±10 | 600 | TAKAHASHI | 72 | HBC | 8 $\pi^- p \to n2\pi$ |
| 1275 ±13 | | ARMENISE | 70 | HBC | 9 $\pi^+ n \to p\pi^+\pi^-$ OCCUR=2 |
| 1261 ± 5 | 1960 | [3] ARMENISE | 68 | DBC | 5.1 $\pi^+ n \to p\pi^+$ MM$^-$ |
| 1270 ±10 | 360 | [3] ARMENISE | 68 | DBC | 5.1 $\pi^+ n \to p\pi^0$ MM OCCUR=2 |
| 1268 ± 6 | | [13] JOHNSON | 68 | HBC | 3.7–4.2 $\pi^- p$ |

YOUR NOTE

[1] Averaged over six nuclear targets, no statistically significant dependence from target nucleus observed. NODE=M005M;LINKAGE=B

[2] T-matrix pole. NODE=M005M;LINKAGE=A

[3] Mass errors enlarged by us to $\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass. NODE=M005M;LINKAGE=T

[4] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. NODE=M005M;LINKAGE=L

[5] From an energy-independent partial-wave analysis. NODE=M005M;LINKAGE=O

[6] From an amplitude analysis of the reaction $\pi^+\pi^- \to 2\pi^0$. NODE=M005M;LINKAGE=P

[7] From an amplitude analysis of $\pi^+\pi^- \to \pi^+\pi^-$ scattering data. NODE=M005M;LINKAGE=S
[8] Using CLEO-c data but not authored by the CLEO Collaboration. NODE=M005M;LINKAGE=C
[9] From a fit to a Breit-Wigner line shape with fixed $\Gamma = 185$ MeV. NODE=M005M;LINKAGE=D
[10] 4-poles, 5-channel K matrix fit. NODE=M005M;LINKAGE=AN
[11] From analysis of L3 data at 91 and 183–209 GeV. NODE=M005M;LINKAGE=SC
[12] Systematic uncertainties not estimated. NODE=M005M;LINKAGE=QQ
[13] JOHNSON 68 includes BONDAR 63, LEE 64, DERADO 65, EISNER 67. NODE=M005M;LINKAGE=J

## $f_2(1270)$ WIDTH

NODE=M005W

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **$185.9^{+\ 2.8}_{-\ 2.1}$ OUR AVERAGE** | | Error includes scale factor of 1.6. See the ideogram below. | | | |
| YOUR DATA $190.3 \pm 1.9 \pm 1.8$ | | [1] BOGOLYUB... | 13 | SPEC | $7\pi^+(K^+,p)A \to n\gamma + X$ |
| $175\ ^{+\ 6}_{-\ 4} \pm 10$ | | ABLIKIM | 06V | BES2 | $e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$ |
| $190 \pm 20$ | | ABLIKIM | 05 | BES2 | $J/\psi \to \phi\pi^+\pi^-$ |
| $171 \pm 10$ | | ALDE | 98 | GAM4 | $100\ \pi^- p \to \pi^0\pi^0 n$ |
| $204 \pm 20$ | | [2] BERTIN | 97C | OBLX | $0.0\ \bar{p}p \to \pi^+\pi^-\pi^0$ |
| $192 \pm 5$ | 200k | PROKOSHKIN | 94 | GAM2 | $38\ \pi^- p \to \pi^0\pi^0 n$ |
| $180 \pm 24$ | | AGUILAR-... | 91 | EHS | $400\ pp$ |
| $169 \pm 9$ | 5730 | [3] AUGUSTIN | 89 | DM2 | $e^+e^- \to 5\pi$ |
| $150 \pm 30$ | 400 | [3] ALDE | 87 | GAM4 | $100\ \pi^- p \to 4\pi^0 n$ |
| $186\ ^{+\ 9}_{-\ 2}$ | | [4] LONGACRE | 86 | MPS | $22\ \pi^- p \to n2K^0_S$ |
| $179.2^{+\ 6.9}_{-\ 6.6}$ | | [5] CHABAUD | 83 | ASPK | $17\ \pi^- p$ polarized |
| $160 \pm 11$ | | DENNEY | 83 | LASS | $10\ \pi^+ N$ |
| $196 \pm 10$ | 3k | APEL | 82 | CNTR | $25\ \pi^- p \to n2\pi^0$ |
| $152 \pm 9$ | | [6] CASON | 82 | STRC | $8\ \pi^+ p \to \Delta^{++}\pi^0\pi^0$ |
| $186 \pm 27$ | 11600 | GIDAL | 81 | MRK2 | $J/\psi$ decay |
| $216 \pm 13$ | | [7] CORDEN | 79 | OMEG | $12$–$15\ \pi^- p \to n2\pi$ |
| $190 \pm 10$ | 10k | APEL | 75 | NICE | $40\ \pi^- p \to n2\pi^0$ |
| $192 \pm 16$ | 4600 | ENGLER | 74 | DBC | $6\ \pi^+ n \to \pi^+\pi^- p$ |
| $183 \pm 15$ | 5300 | FLATTE | 71 | HBC | $7\ \pi^+ p \to \Delta^{++} f_2$ |
| $196 \pm 30$ | | [3] STUNTEBECK | 70 | HBC | $8\ \pi^- p$, $5.4\ \pi^+ d$ |
| $216 \pm 20$ | 1960 | [3] ARMENISE | 68 | DBC | $5.1\ \pi^+ n \to p\pi^+ \mathrm{MM}^-$ OCCUR=2 |
| $128 \pm 27$ | | [3] BOESEBECK | 68 | HBC | $8\ \pi^+ p$ |
| $176 \pm 21$ | | [3,8] JOHNSON | 68 | HBC | $3.7$–$4.2\ \pi^- p$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $194 \pm 36$ | | [9] ANISOVICH | 09 | RVUE | $0.0\ \bar{p}p$, $\pi N$ |
| $195 \pm 15$ | 870 | [10] SCHEGELSKY | 06A | RVUE | $\gamma\gamma \to K^0_S K^0_S$ |
| $121 \pm 26$ | | TIKHOMIROV | 03 | SPEC | $40.0\ \pi^- \mathrm{C} \to K^0_S K^0_S K^0_L X$ |
| $187 \pm 20$ | | [11] ALDE | 97 | GAM2 | $450\ pp \to pp\pi^0\pi^0$ |
| $184 \pm 10$ | | [11] GRYGOREV | 96 | SPEC | $40\ \pi^- N \to K^0_S K^0_S X$ |
| $200 \pm 10$ | | AKER | 91 | CBAR | $0.0\ \bar{p}p \to 3\pi^0$ |
| $240 \pm 40$ | 3k | BINON | 83 | GAM2 | $38\ \pi^- p \to n2\eta$ |
| $187 \pm 30$ | 650 | [3] ANTIPOV | 77 | CIBS | $25\ \pi^- p \to p3\pi$ |
| $225 \pm 38$ | 16000 | DEUTSCH... | 76 | HBC | $16\ \pi^+ p$ |
| $166 \pm 28$ | 600 | [3] TAKAHASHI | 72 | HBC | $8\ \pi^- p \to n2\pi$ |
| $173 \pm 53$ | | [3] ARMENISE | 70 | HBC | $9\ \pi^+ n \to p\pi^+\pi^-$ OCCUR=2 |

YOUR NOTE
[1] Averaged over six nuclear targets, no statistically significant dependence from target nucleus observed. NODE=M005W;LINKAGE=C
[2] T-matrix pole. NODE=M005W;LINKAGE=QA
[3] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass. NODE=M005W;LINKAGE=T
[4] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. NODE=M005W;LINKAGE=L
[5] From an energy-independent partial-wave analysis. NODE=M005W;LINKAGE=R
[6] From an amplitude analysis of the reaction $\pi^+\pi^- \to 2\pi^0$. NODE=M005W;LINKAGE=Q
[7] From an amplitude analysis of $\pi^+\pi^- \to \pi^+\pi^-$ scattering data. NODE=M005W;LINKAGE=U
[8] JOHNSON 68 includes BONDAR 63, LEE 64, DERADO 65, EISNER 67. NODE=M005W;LINKAGE=J
[9] 4-poles, 5-channel K matrix fit. NODE=M005W;LINKAGE=AN
[10] From analysis of L3 data at 91 and 183–209 GeV. NODE=M005W;LINKAGE=SC
[11] Systematic uncertainties not estimated. NODE=M005W;LINKAGE=QQ

# $f_2(1270)$ REFERENCES

NODE=M005

| | | | | | | |
|---|---|---|---|---|---|---|
| | DOBBS | 15 | PR D91 052006 | S. Dobbs *et al.* | (NWES) | REFID=56805 |
| YOUR PAPER | BOGOLYUB... | 13 | PAN 76 1324 | M.Yu. Bogolyubsky *et al.* | (HYPERON-M Collab.) | REFID=55585 |
| | | | Translated from YAF 76 1389. | | | |
| | ANISOVICH | 09 | IJMP A24 2481 | V.V. Anisovich, A.V. Sarantsev | | REFID=52719 |
| | ABLIKIM | 06V | PL B642 441 | M. Ablikim *et al.* | (BES Collab.) | REFID=51507 |
| | SCHEGELSKY | 06A | EPJ A27 207 | V.A. Schegelsky *et al.* | | REFID=51185 |
| | ABLIKIM | 05 | PL B607 243 | M. Ablikim *et al.* | (BES Collab.) | REFID=50450 |
| | TIKHOMIROV | 03 | PAN 66 828 | G.D. Tikhomirov *et al.* | | REFID=49423 |
| | | | Translated from YAF 66 860. | | | |
| | ALDE | 98 | EPJ A3 361 | D. Alde *et al.* | (GAM4 Collab.) | REFID=46605 |
| | Also | | PAN 62 405 | D. Alde *et al.* | (GAMS Collab.) | REFID=46914 |
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| | ALDE | 97 | PL B397 350 | D.M. Alde *et al.* | (GAMS Collab.) | REFID=45392 |
| | BERTIN | 97C | PL B408 476 | A. Bertin *et al.* | (OBELIX Collab.) | REFID=45701 |
| | GRYGOREV | 96 | PAN 59 2105 | V.K. Grigoriev, O.N. Baloshin, B.P. Barkov | (ITEP) | REFID=45566 |
| | | | Translated from YAF 59 2187. | | | |
| | PROKOSHKIN | 94 | SPD 39 420 | Y.D. Prokoshkin, A.A. Kondashov | (SERP) | REFID=44094 |
| | | | Translated from DANS 336 613. | | | |
| | AGUILAR-... | 91 | ZPHY C50 405 | M. Aguilar-Benitez *et al.* | (LEBC-EHS Collab.) | REFID=41637 |
| | AKER | 91 | PL B260 249 | E. Aker *et al.* | (Crystal Barrel Collab.) | REFID=41587 |
| | BREAKSTONE | 90 | ZPHY C48 569 | A.M. Breakstone *et al.* | (ISU, BGNA, CERN+) | REFID=41376 |
| | AUGUSTIN | 89 | NP B320 1 | J.E. Augustin, G. Cosme | (DM2 Collab.) | REFID=41004 |
| | ALDE | 87 | PL B198 286 | D.M. Alde *et al.* | (LANL, BRUX, SERP, LAPP) | REFID=40221 |
| | AUGUSTIN | 87 | ZPHY C36 369 | J.E. Augustin *et al.* | (LALO, CLER, FRAS+) | REFID=40268 |
| | ABACHI | 86B | PRL 57 1990 | S. Abachi *et al.* | (PURD, ANL, IND, MICH+) | REFID=20394 |
| | LONGACRE | 86 | PL B177 223 | R.S. Longacre *et al.* | (BNL, BRAN, CUNY+) | REFID=20768 |
| | COURAU | 84 | PL 147B 227 | A. Courau *et al.* | (CIT, SLAC) | REFID=20758 |
| | BINON | 83 | NC 78A 313 | F.G. Binon *et al.* | (BELG, LAPP, SERP+) | REFID=20750 |
| | Also | | SJNP 38 561 | F.G. Binon *et al.* | (BELG, LAPP, SERP+) | REFID=20751 |
| | | | Translated from YAF 38 934. | | | |
| | CHABAUD | 83 | NP B223 1 | V. Chabaud *et al.* | (CERN, CRAC, MPIM) | REFID=20131 |
| | DENNEY | 83 | PR D28 2726 | D.L. Denney *et al.* | (IOWA, MICH) | REFID=20754 |
| | APEL | 82 | NP B201 197 | W.D. Apel *et al.* | (KARLK, KARLE, PISA, SERP+) | REFID=20745 |
| | CASON | 82 | PRL 48 1316 | N.M. Cason *et al.* | (NDAM, ANL) | REFID=20746 |
| | GIDAL | 81 | PL 107B 153 | G. Gidal *et al.* | (SLAC, LBL) | REFID=20386 |
| | CORDEN | 79 | NP B157 250 | M.J. Corden *et al.* | (BIRM, RHEL, TELA+) | REFID=20374 |
| | ANTIPOV | 77 | NP B119 45 | Y.M. Antipov *et al.* | (SERP, GEVA) | REFID=20728 |
| | DEUTSCH... | 76 | NP B103 426 | M. Deutschmann *et al.* | (AACH3, BERL, BONN+) | REFID=20119 |
| | APEL | 75 | PL 57B 398 | W.D. Apel *et al.* | (KARLK, KARLE, PISA, SERP+) | REFID=20720 |
| | ENGLER | 74 | PR D10 2070 | A. Engler *et al.* | (CMU, CASE) | REFID=20110 |
| | TAKAHASHI | 72 | PR D6 1266 | K. Takahashi *et al.* | (TOHOK, PENN, NDAM+) | REFID=20103 |
| | FLATTE | 71 | PL 34B 551 | S.M. Flatte *et al.* | (LBL) | REFID=20700 |
| | ARMENISE | 70 | LNC 4 199 | N. Armenise *et al.* | (BARI, BGNA, FIRZ) | REFID=20693 |
| | STUNTEBECK | 70 | PL 32B 391 | P.H. Stuntebeck *et al.* | (NDAM) | REFID=20696 |
| | ARMENISE | 68 | NC 54A 999 | N. Armenise *et al.* | (BARI, BGNA, FIRZ+) | REFID=20054 |
| | BOESEBECK | 68 | NP B4 501 | K. Boesebeck *et al.* | (AACH, BERL, CERN) | REFID=20585 |
| | JOHNSON | 68 | PR 176 1651 | P.B. Johnson *et al.* | (NDAM, PURD, SLAC) | REFID=20065 |
| | EISNER | 67 | PR 164 1699 | R.L. Eisner *et al.* | (PURD) | REFID=20046 |
| | DERADO | 65 | PRL 14 872 | I. Derado *et al.* | (NDAM) | REFID=20668 |
| | LEE | 64 | PRL 12 342 | Y.Y. Lee *et al.* | (MICH) | REFID=20663 |
| | BONDAR | 63 | PL 5 153 | L. Bondar *et al.* | (AACH, BIRM, BONN, DESY+) | REFID=20657 |