A search for $f_j(2220)$ in hadronic Z^0 decays

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for the OPAL collaboration

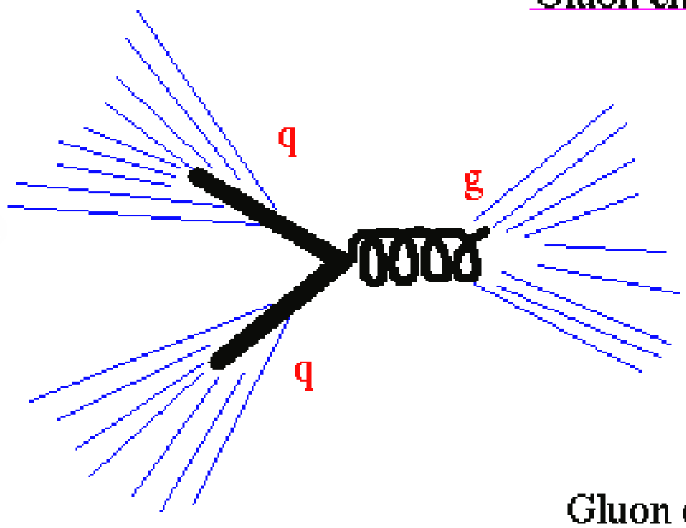
- Seen by MARK III in radiative $\mathbf{J}/\psi$ decays in $\mathbf{K_S^0 K_S^0}$ and $\mathbf{K^+ K^-}$

  $\mathrm{M} = 2230\ \mathrm{MeV}$; Narrow $\simeq 20\ \mathrm{MeV}$.
- DM2 : a braod structure
- BES : Various flavour-independent decay channels in radiative $\mathbf{J}/\psi$ decays;
- L3 preliminary : Gluon jets ?? Is it confirmed ??
- NOT seen in $\gamma\gamma$

Doesn't look like a $\mathbf{q\bar{q}}$ meson.

Where to look /not look

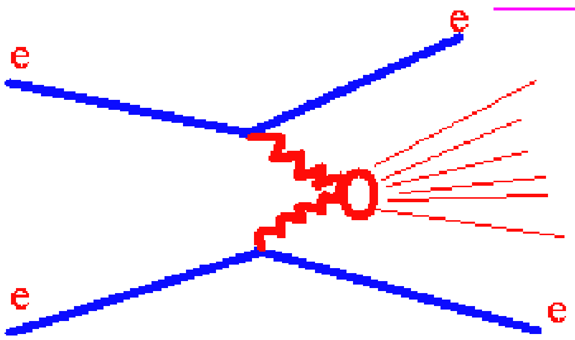
Gluon enriched source



–High multiplicity,
–High combinatorial fot
mass reconstruction

– No PWA or very difficult

Gluon depleted source



Look for signals of known candidats. They should not show up if Glueballs.

– Also ralatively High mult.
– PWA difficult

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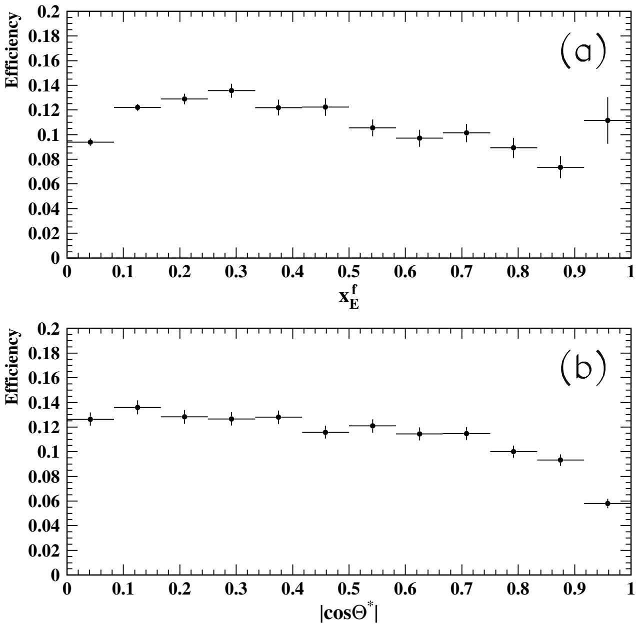
Some parameters

- 4.3 Million hadronic Z^0 decays analyzed
- $K^0_S \rightarrow \pi^+\pi^-$ rescontruction; OPAL good tracking: Efficiency and resolution ($\simeq 5\mathrm{MeV}$).
- 12 MeV mass resolution for $X(2220) \rightarrow K^0_S K^0_S \rightarrow 2(\pi^+\pi^-)$ object.
- X(2220) reconstruction Efficiency : 10% varies slowly with x_E.



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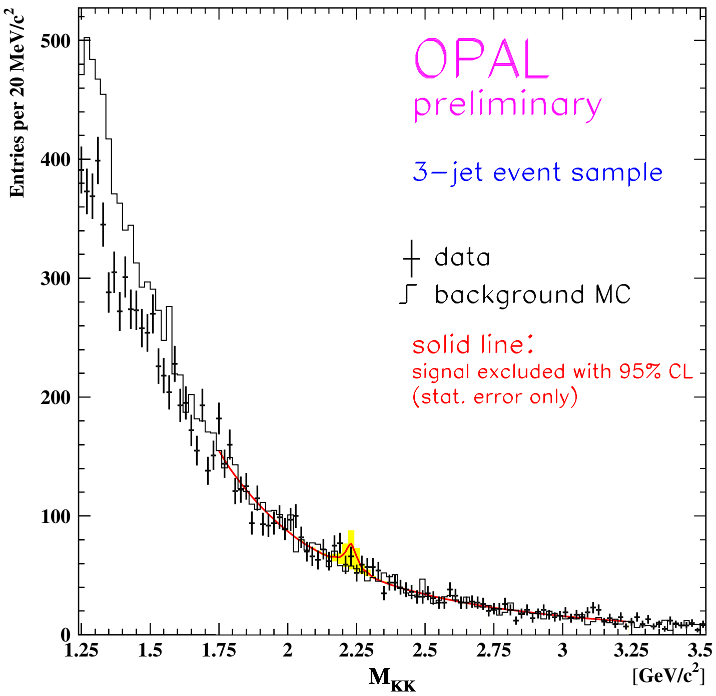
No $\xi(2.2)$ SIGNAL in OPAL;

Abscent in the full Z^0 inclusive sample;

Abscent in Three jet events;

Also abscent in gluon enriched jet sample.



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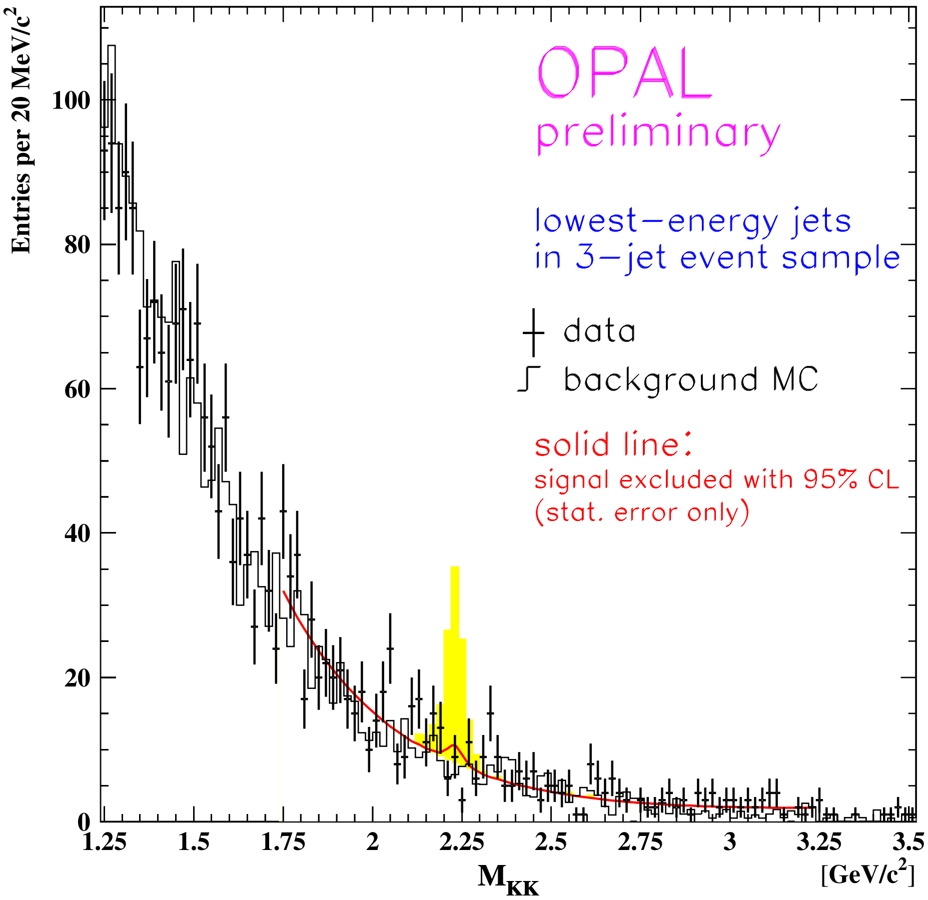

If N is the Inclusive rate per Z decay then:

$$\mathbf{N \times BR_{\xi \to K\bar{K}} < 0.0028 \text{ at } 95\% \text{ CL}}$$

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CONCLUSION

- No evidence for any $\mathbf{f_j(2230)}$ at OPAL.
- If N is the Inclusive rate per Z decay then:

$$\mathbf{N \times BR_{\xi \to K\bar{K}} < 0.0028 \ at \ 95\% \ CL}$$

- $\mathrm{K^-K^+}$ analysis : Same sensitivity : results soon.