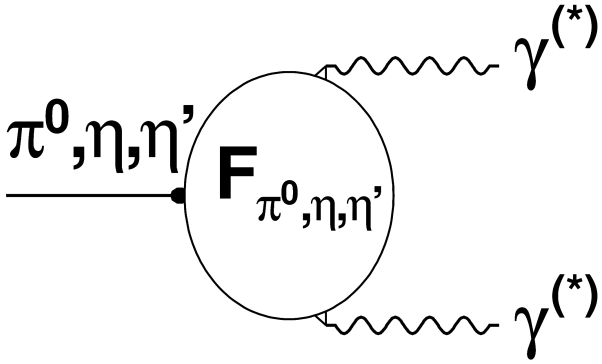
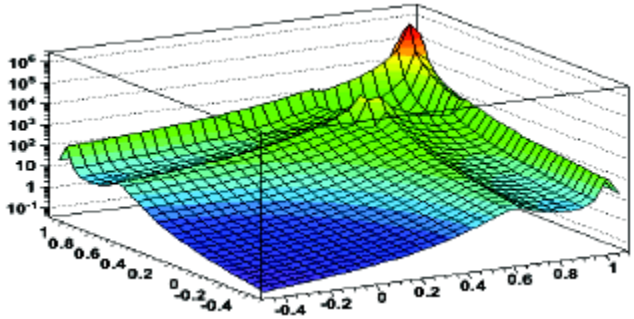
Mesons TFF:white book/road map



Workshop on Meson Transition Form Factors

May 29-30, 2012 in Cracow, Poland



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S.Eidelman,A. Kupść

ECT Trento April 11, 2013

Information | References (115) | Citations (1) | Files | Plots

MesonNet Workshop on Meson Transition Form Factors.

E. Czerwinski, S. Eidelman, C. Hanhart, B. Kubis, A. Kupsc, S. Leupold, P. Moskal, S. Schadmand.

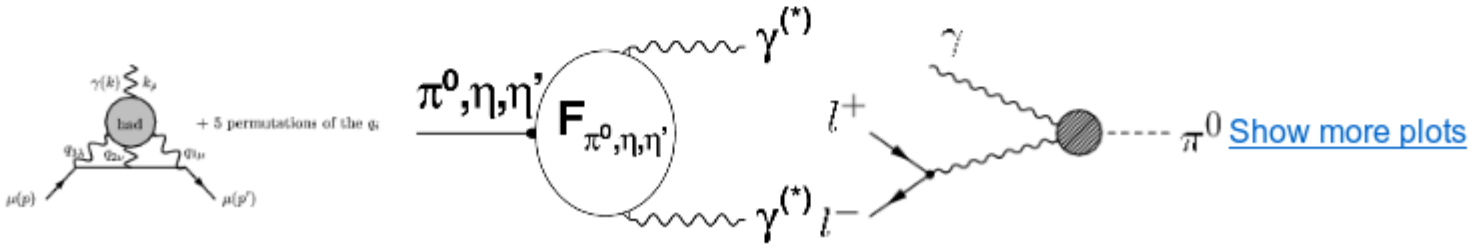
Jul 2012
69 pp.

e-Print: arXiv:1207.6556 [hep-ph] PDF

Abstract: The mini-proceedings of the Workshop on Meson Transition Form Factors held in Cracow from May 29th to 30th, 2012 introduce the meson transition form factor project with special emphasis on the interrelations between the various form factors (on-shell, single off-shell, double off-shell). Short summaries of the talks presented at the workshop follow.

Note: * Temporary entry *; 69 pages, 14 figures/ all talks can be found at http://www2.fz-juelich.de /ikp//mesonnet/meetings/2012_ff_workshop.shtml

Keyword(s): INSPIRE: conference | form factor: transition | meson



Show more plots

Record created 2012-07-30, last modified 2012-08-03

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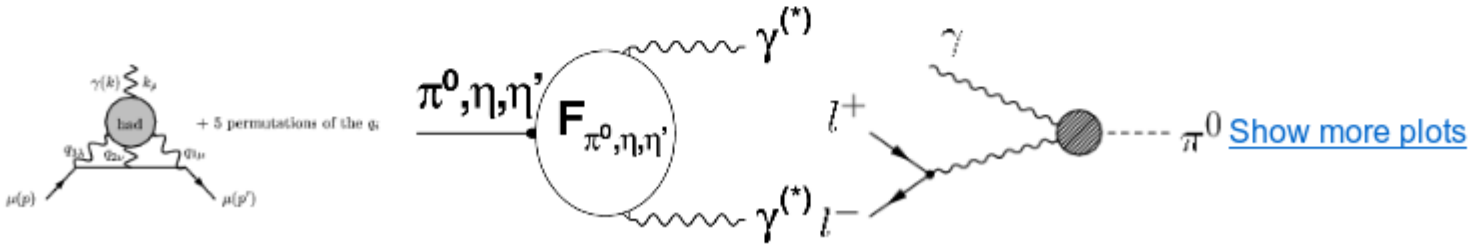

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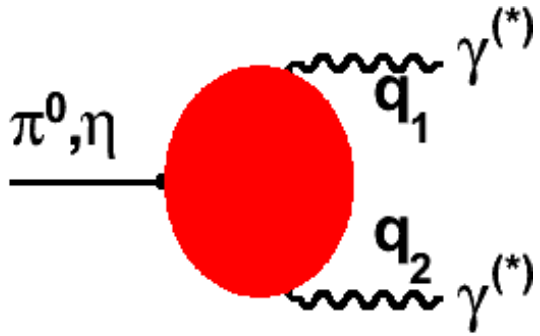
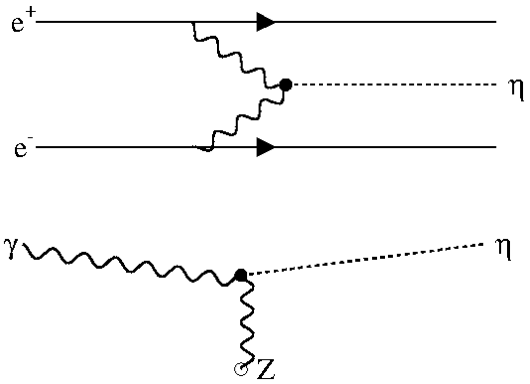
%% Is it possible to add in experimental (and theoretical?) refs., where %%available? That would certainly provide a useful collection}.

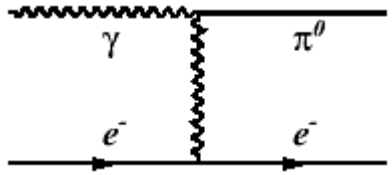
List of processes

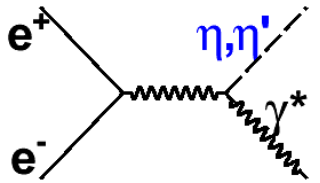
1. P: $P = \pi^0, \eta, \eta', \quad V = \omega, \phi$
   - P: $\to 2\gamma$, $\to \gamma\, e^+e^-$, $\to e^+e^-\, e^+e^-$
   - $e^+e^- \to P\,\gamma$
   - $e^+e^- \to P\, e^+e^-$
   - $\gamma e^- \to P\, e^-$
2. P and V:
   - $V \to P\,\gamma$
   - $V \to P\, e^+e^-$
   - $e^+e^- \to V\, P$
3. P^0, π^+ and π^-:
   - $\pi^\pm\,\gamma \to \pi^0\,\pi^\pm$
   - $e^+e^- \to \pi^0\,\pi^+\,\pi^-$
   - $\eta' \to \pi^+\pi^-\,\gamma$



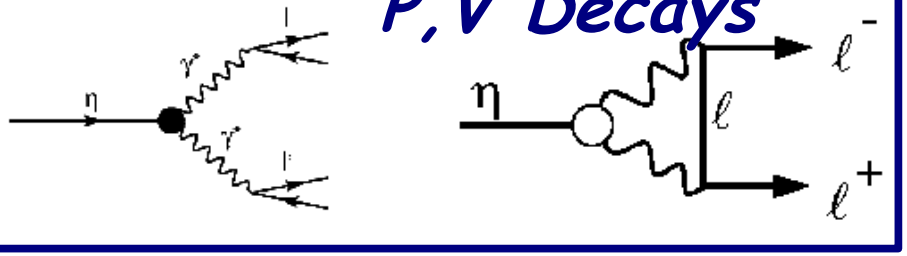
Production







P, V Decays



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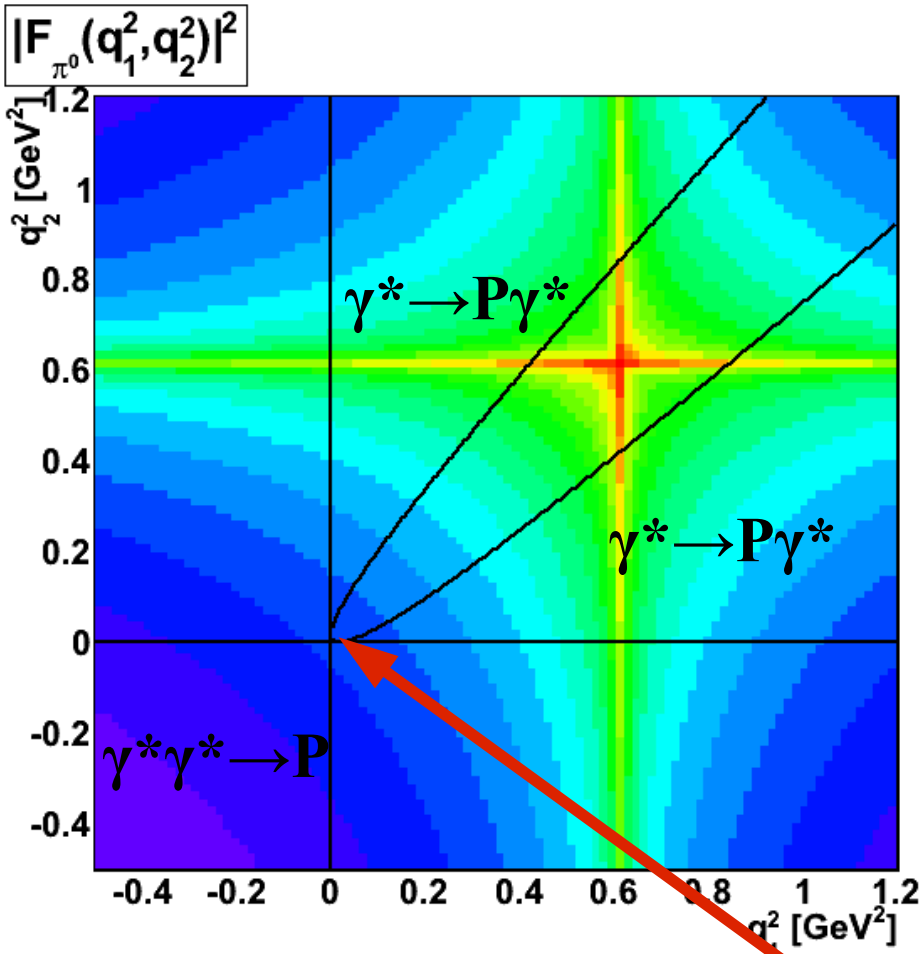
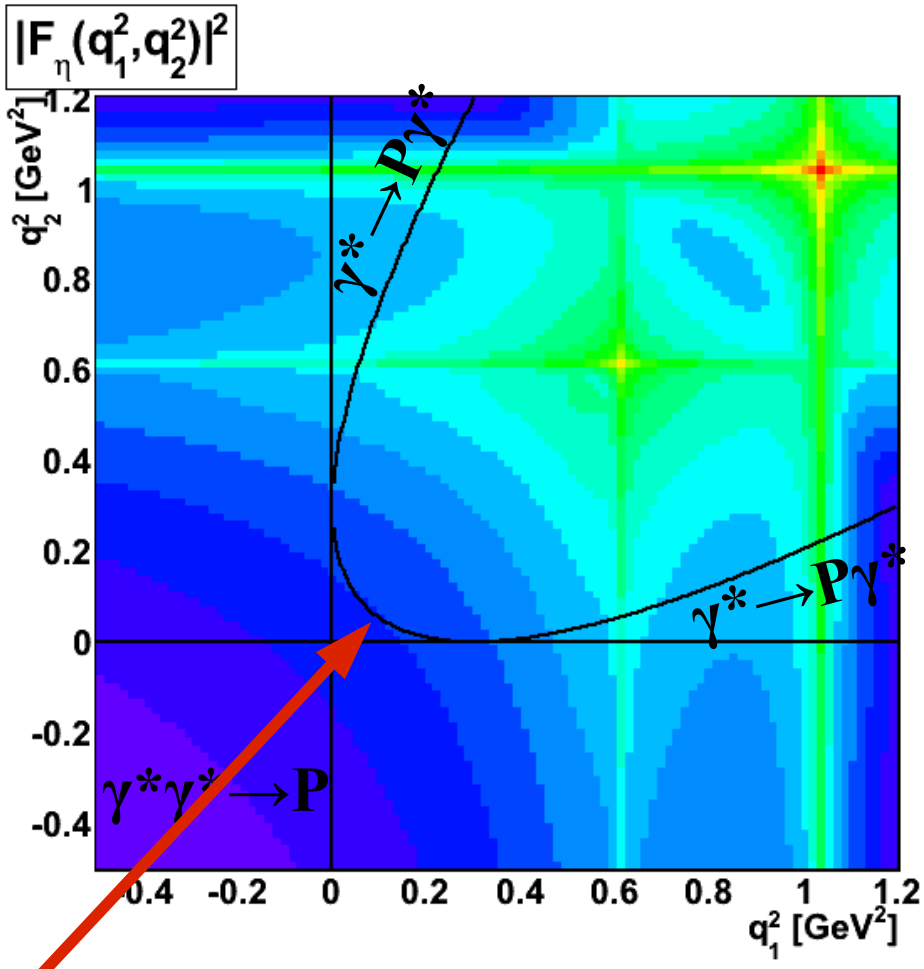
TFF kinematical regions, observables





P→γ*γ*

$\Gamma(P \to \gamma\gamma)$

$|F_P(q_1^2, q_2^2)|^2$

$\mathrm{Re}(F_P(q_1^2, q_2^2) F_P^*(q_2^2, q_1^2))$

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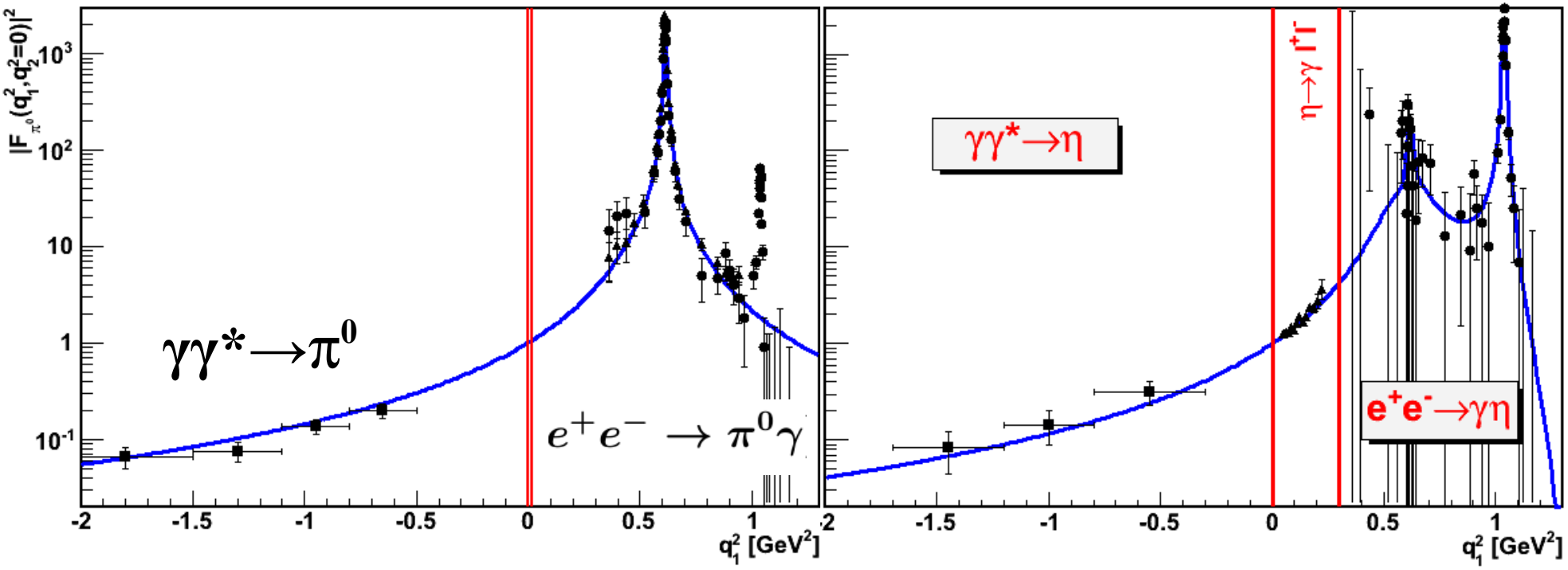
$F_P(q^2,0)$



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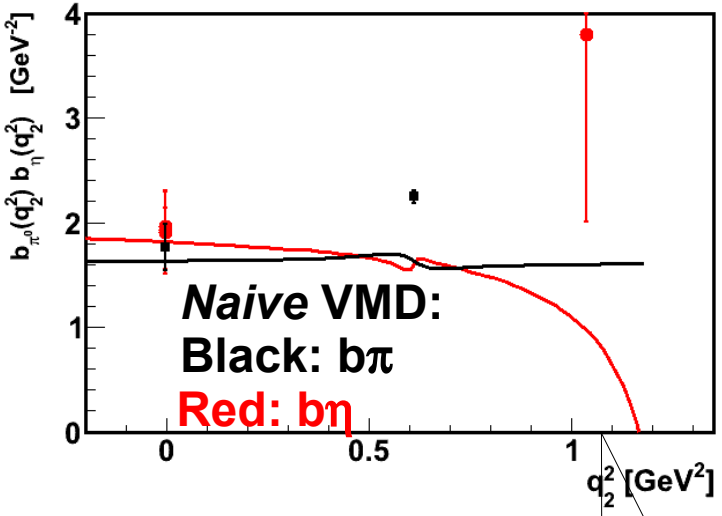
Triangles: NA60 η–> μ+μ–γ; Circles: CMD-2: e+e- → η γ e+e- → π^0 γ
Squares: CELLO

Double off shell TFF

slopes bπ, bη

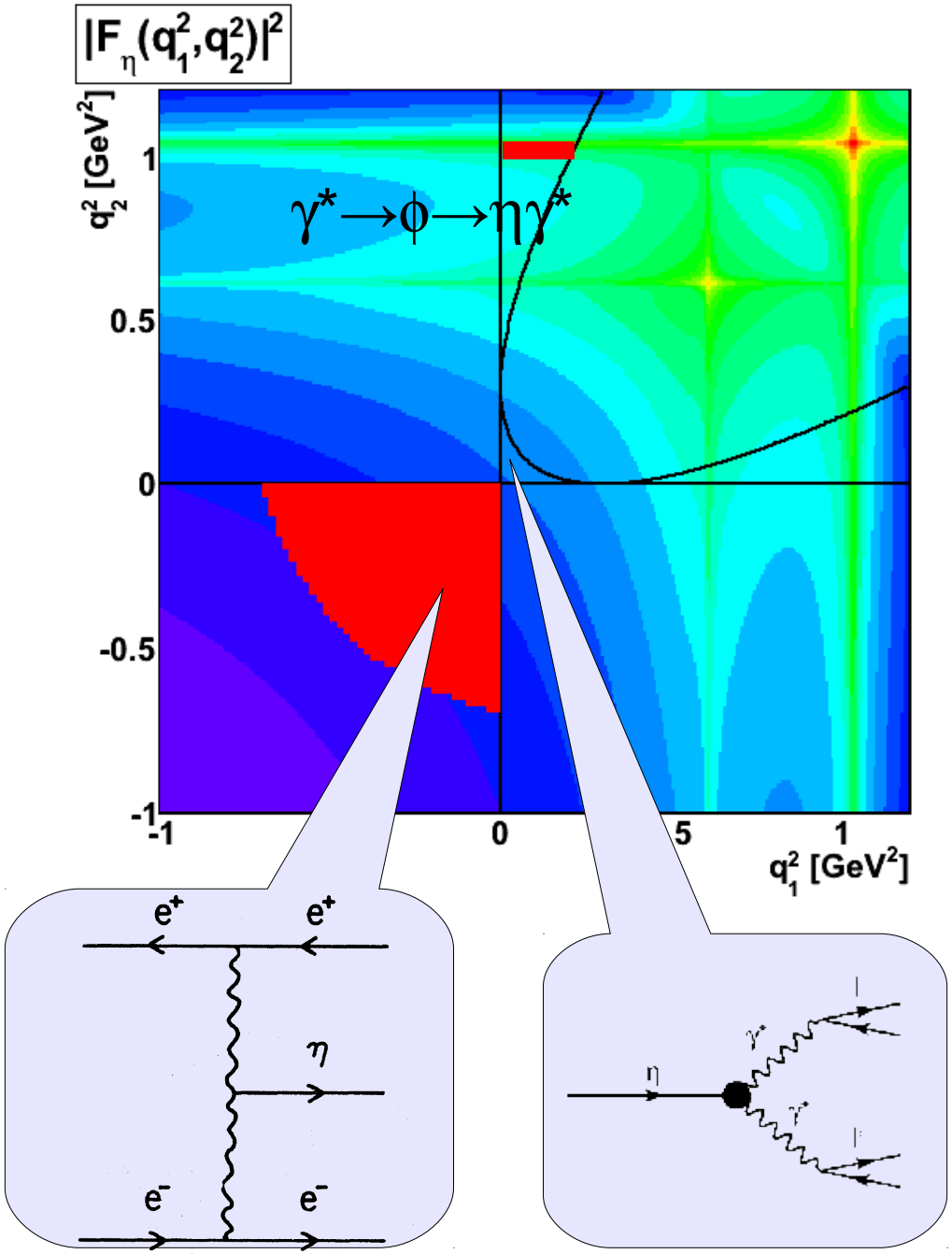
$$b_P(q_2^2) = \left.\frac{\partial \ln |F(q_1^2, q_2^2)|}{\partial q_1^2}\right|_{q_1^2=0}$$



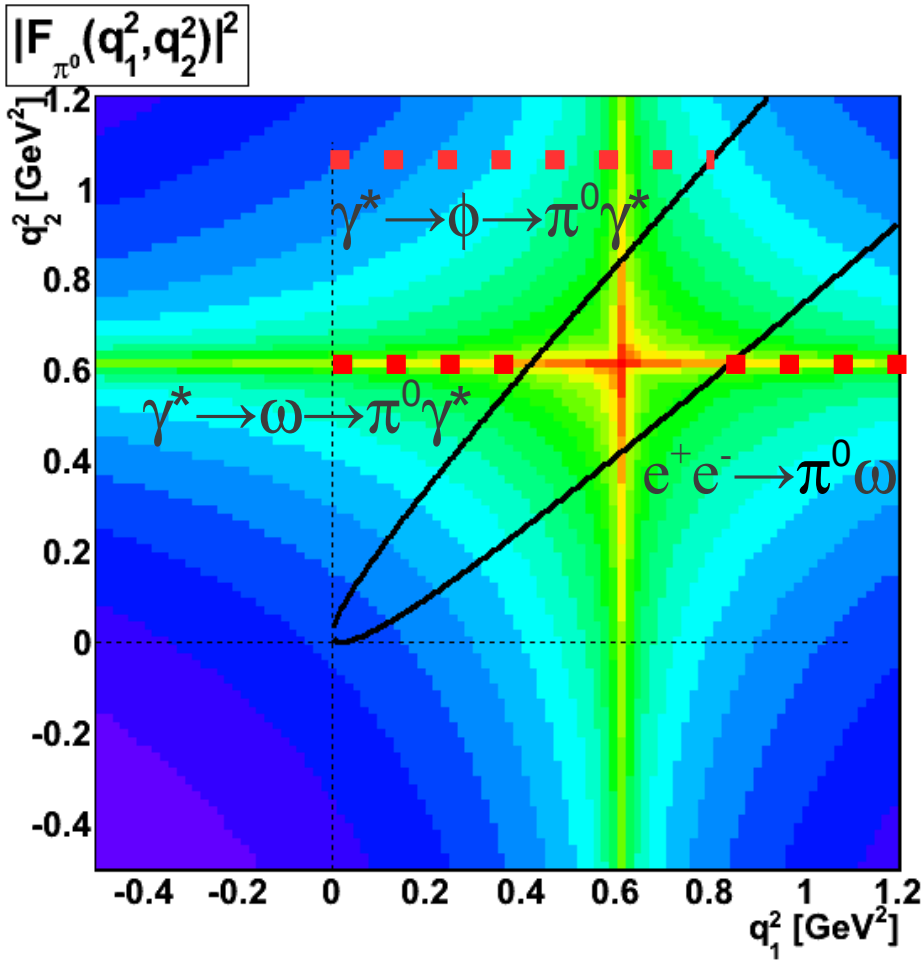
KLOE goal: measure $b_\eta(m^2_\phi)$

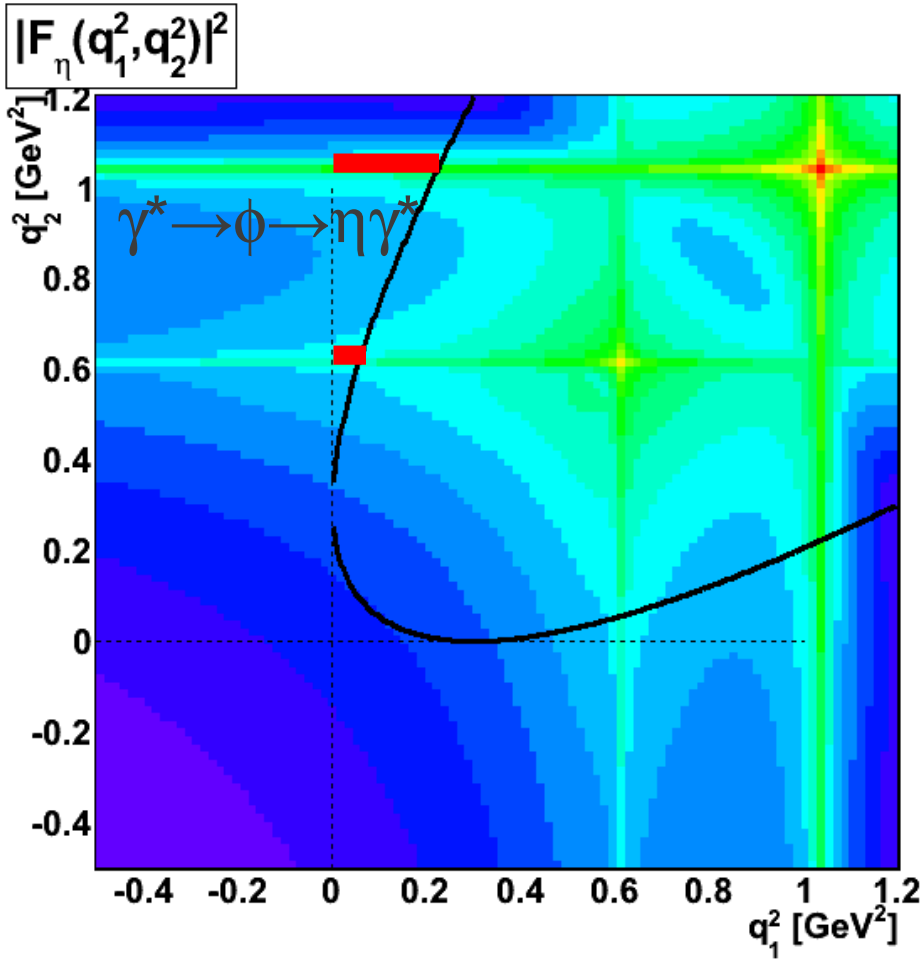
$\phi \to \eta\gamma^*$ BR 10^{-4}

$b_{\pi^0}(m^2_\phi)$ $\phi \to \pi^0\gamma^*$ BR 10^{-5}



V → Pγ* and e+e- → PV processes





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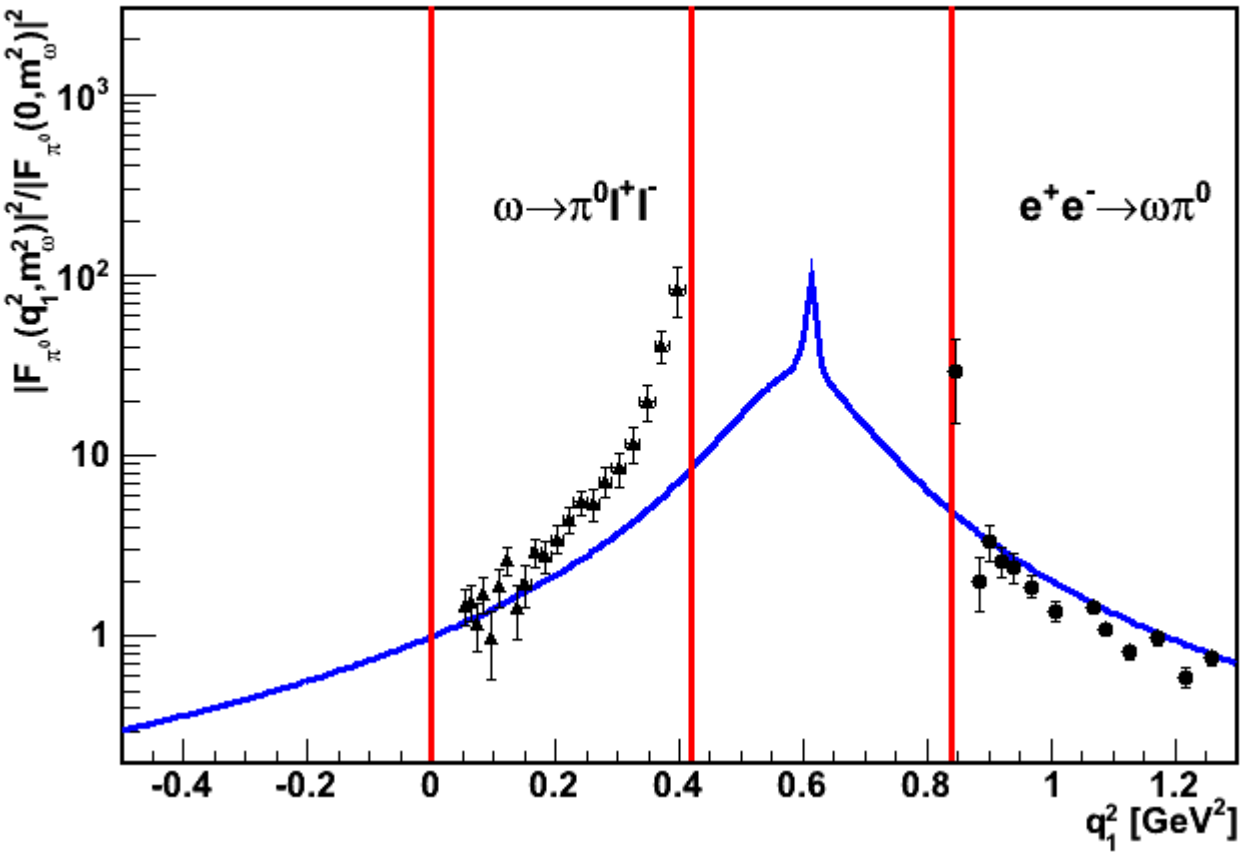
$\omega\pi^0$ transition form factor



$$\frac{|F_{\pi^0}(q_1^2, m_\omega^2)|^2}{|F_{\pi^0}(0, m_\omega^2)|^2}$$

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TFF a roadmap?

- List/data base of related experiments
- TFF parametrization 2D (timelike)
- Henryk, Sergiy (EKHARA), M.Benayoun

Support for new analyses/facilities

- e+e- machines (s,c,b)

  +KLOE-2 off peak

  +VEPP-2000<600MeV

  + new low energy machines, γe-,e-e-
- Decays: CLAS, CMS,...

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