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Unified dispersive approach to gamma* -> gamma pi pi and gamma gamma -> pi pi at low energy

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We discuss how to generalize the classic results on photon-photon scattering which combine dispersion theoretical constraints with chiral symmetry and soft photon theorems to the photon-photon*(q^2) scattering amplitude into a pion pair. This generalisation requires a specific treatment of resonance exchange diagrams. The constructed amplitude displays explicitly the dependence on pi-pi phase-shifts, pion electromagnetic form factors (being also sensitive to the omega-pi form factor puzzle) and pion polarizabilities. It is matched to the NLO ChPT amplitude near zero energies and compared to experimental measurements of e^+ e^- -> gamma pi0 pi0 by SND and CMD-2 below one GeV. Applications are made to the pions generalized polarizabilities, to the sigma meson (pole) electromagnetic form factor and to the gamma pi pi contribution to the HVP and the muon g-2.

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