A partial list of references for Chiral Perturbation Theory in the Meson Sector

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1 Introduction

This is intended to be a mnemonic device for me, so it is not a review article nor a complete list of references but rather a list of papers I have used at some point and will want to find easily again. It is also skewed

towards my own work. In my published work I have tried to have complete literatures.

Especially ChPT for baryons and heavy quarks is very poorly represented. This list is a continuous work in progress.

2 Basic papers

The three main papers:

- Weinberg 1978 [1]
- Gasser-Leutwyler 2 flavour [2]
- Gasser-Leutwyler 3 flavour [3]

3 Other basic papers

- The short 2-flavour GL paper [4]

4 Oldies: i.e. before my time

Note only here if not under some other heading

- Goldberger-Treiman relation [5]
- PCAC [6, 7]
- Current algebra [8]
- Adler zeros/consistency conditions [9, 10]
- Gell-Mann–Oakes-Renner relation [11]
- Weinberg's chiral lagrangian [12]
- The CCWZ formulation, including a powercounting argument [13, 14]
- There are chiral logs [15]
- Review early work on chiral logs [16]

5 Introductory

6 Reviews

- Anomalous sector [17]
- Two-loop review [18]

7 Extensions

7.1 Two-loops (principles)

- Formalism description [19]
- p^6-Lagrangian Fearing-Scherer [20]
- p^6-Lagrangian BCE [21]
- One term too many for $SU(2)$ [22]
- p^6 divergences and general formalism [23]
- relation 2-3 flavour: p^4 [3]
- relation 2-3 flavour: p^6 [24, 25]
- Relations independent of LECS [26]

7.2 Anomalous sector

- Steinberger [27]
- Bell-Jakiw in ABJ [28]
- Adler in ABJ [29]
- Adler-Bardeen theorem [30]
- Anomalous Ward identies, Bardeen [31]
- WZW Wess-Zumino [32]
- WZW Witten [33]
- Divergences: Donoghue-Wyler (principle good but wrong) [34], First correct [35], probably wrong [36], Issler [37, 38]
- Divergence final [39], but note bit missing in 2-flavour case in first version.
- p^6-Lagrangian [39, 40]
- Two-flavour WZW [41]

7.3 Finite volume

- The start [42]

7.4 Finite temperature

- The start [43, 44]

7.5 Including electromagnetism

7.6 Quenched

7.7 Partially quenched

7.8 Energy-momentum tensor

At one-loop [45]

7.9 Vectors with anti-symmetric tensor

- Tree level [46]
- At one loop (i.e. p^6) [47]

7.10 Vector meson ChPT

- First paper [48]
- $\tau \to VP\nu_\tau$ [49]
- Masses to p^4 [50]
- Matching, some theoretical issues [51]
- Decay constants [52]
- IR regularization [53]
- f_V^T/f_V [54]

7.11 Tensor mesons

- Start: [55]
- Quenched/partially quenched [56]

7.12 Heavy kaons

7.13 Other symmetry groups

This includes $SU(N) \times SU(N)/SU(N)$ but these are often listed as N-flavour results in the other sections.

8 Processes

8.1 Masses

8.2 Decay constants

8.3 $\pi\pi$ scattering

- Tree level [57]
- One-loop/Chiral logs [58, 59]
- One-loop [60, 2]
- Two-loops, nonanalytic part [61]
- Two-loops [62, 19]
- One-loop 3-flavour [63]
- Two-loop 3-flavour [64]
- One-loop N-flavour [65]
- Two-loop N-flavour [66]

8.4 πK scattering

- One-loop [63]
- Two-loop [67]

8.5 Electromagnetic formfactors

- 2 flavour pion one-loop [2]
- 2 flavour pion two-loop [68]
- 3 flavour pion and kaon: one-loop [69]
- 3 flavour pion and kaon: two-loop [70]

8.6 Scalar formfactors

- 2 flavour pion one-loop [2]
- 2 flavour pion two-loop [68]
- 3 flavour pion and kaon: one-loop [69]
- 3 flavour pion and kaon: two-loop [71]

8.7 $\eta \to 3\pi$

- Chiral logs [72]
- One-loop [73]
- Two-loop [74]

8.8 τ-decays

- two-flavour case [75]
- The vector formfactor parts can be taken from the two-loop calculations of these.
- The axial form-factor

8.9 $\gamma \to \pi\pi\pi$

- Tree level [76, 77]
- One-loop [78], off-shell in [79]
- Electromagnetic corrections [80]
- A very partial two-loop calculation [81]

8.10 $\eta \to \pi^0\gamma\gamma$

- One-loop [82]

8.11 $\gamma\gamma \to \pi\pi\pi$

- Current algebra [76]
- At one-loop [83] [84]

9 Information on coupling constants

9.1 Estimates: resonance saturation

- Vector mesons already in first GL paper [2]
- Resonance saturation: EGPR [46]
- Resonance saturation: Donoghue et al. [85]
- Vector meson part independent of parametrization [86]

10 Chiral logarithms only

Note: many are named in the specific processes and not here

11 Renormalization group

- General idea: [1]
- Double logs $\pi\pi$ [87]
- Double logs: general [88]
- General proof
- Massles limit applications

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