

Status of “Exotic Hadrons” Chapter

- Overall goal: Discuss prospects for studying exotic hadrons with proton beams of $p_{\max} = 30 \text{ GeV}/c$, $\sqrt{s} < 7.6 \text{ GeV}$
- Discussed interesting channels for exotic hadrons
- Key reactions for P_{cc} search: $pp \rightarrow ppJ/\psi$, $pD^{(*)}\Lambda_c^+$, $pD^{(*)}\Sigma_c^+$
 - Coordinating discussion with other chapters
- Closed/hidden-charm exotics:
 - Charge-exchange reactions: $pp \rightarrow pZ_c^- \Delta^{++}$
 - pion-exchange? requires reconstruction of n or Δ^{++}
 - Strange partners: $pp \rightarrow pZ_{cs}^+ \Lambda$
 - Rare process: flavor-exotic tetraquarks:
 $pp \rightarrow pT_{cs}\Xi_c \rightarrow p(DK)\Xi_c$

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- Strange dibaryons: $pp \rightarrow d_s^* \rightarrow \Delta\Sigma^* \rightarrow p\pi\pi\Lambda$
- Light-quark exotics most difficult
 - Comparing production in $K\bar{K}$, $K\bar{K}^*$, $K^*\bar{K}^*$ important for understanding strangeonia exotics
 - Reactions like $pp \rightarrow pK^+K^-\pi^-\Delta^{++}$ could be used
- Generally good π/K PID is required
- Expect all contributions in hand by end of Dec.
 - Provide guidance for future simulations

Outline of “Exotic Hadrons” Chapter

1. Input and knowledge from previous and running experiments (both for light and heavy exotics):
 - Photoproduction Experiments (B. McKinnon/S. Dobbs)
 - [e+e- Experiments \(N. Huesken\)](#)
 - Hadron Beam experiments (B. Grube)
 - [LHC Experiments \(L. An\)](#)
2. Light quark exotics
 - Lattice direct calculation - C. Morningstar
 - [Dibaryons - Bashkanov](#)
 - Phenomenology - E. Swanson, C. Fischer, F. Giacosa
3. Heavy exotics
 - Lattice direct calculation - C. Morningstar
 - BOEFT - N. Brambilla
 - Lattice BO static energies - C. Morningstar
 - Molecules - C. Hanahrt, F.K. Guo, T. Mehen
 - Production - N. Brambilla, T. Mehen
4. Expectations at SiS100: (S. Dobbs + more)
 - Example heavy quark exotic: P_c^+ in $J/\psi p$ and $D(^*) \Lambda_{b,c}^+$
 - Example light quark exotic: $\phi(2170)$ in $\phi \pi^+ \pi^-$