White Paper Organization

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Organizational Plan

- Short Summary Paper – month or so
  - arXiv submission
  - 3 to 4 pages per working group
  - Overview of the issues and topics discussed
- Longer Paper with detailed discussion of the issues, approaches, and status – six months
  - arXiv and journal submission
  - Detailed comparison of different approaches and comprehensive discussion of what needs to be done
- Next Workshop – Three years hence
  - expect significant progress

Outline of the Short Paper

1. Introduction and physics context
2. The Model Calculations
3. The Lattice Calculations
4. The Connection Between Data and Calculations

Models:

- ENJ-L
- HLS
- MV – OPE constraint
- Holographic Models
- Dyson-Schwinger approach

Lattice:

1. Vacuum Polarization
   a. current results
      i. Twisted Mass
      ii. Staggered
      iii. DWF
   b. Isospin breaking effects
      i. EM corrections
      ii. quark masses
   c. Adler function
2. Light-by-Light
   a. Two and three point calculations
      i. PS-γ-γ correlation function
      ii. AV-γ-γ correlation function
      iii. $\pi^o \longrightarrow e^+e^-$
      iv. $\gamma\gamma Z$ vertex
      v. magnetic susceptibility
   b. Benchmark calculation of 4 point vector correlation function
   c. Direct calculation
   d. QCD + QED calculation

Data and connection to calculations

1. How can data help?
   a. Form Factor Models
2. Data: results and prospects
   a. Existing and planned facilities and experiments
   b. Two-photon physics

   $\gamma\gamma \to \gamma\gamma$, $\gamma^{(*)}\gamma^{(*)} \to P/S$, P/V, T, $\gamma^{(*)}\gamma^{(*)} \to$ hadrons
   c. Radiative and Dalitz decays of pseudoscalar and vector mesons, Double Dalitz decays, $\pi^o \to e^+e^-$
3. Theory to support data
   a. Monte Carlo generators