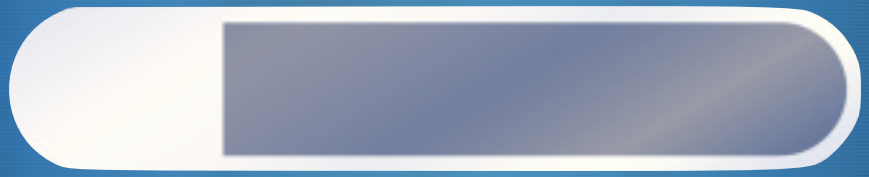
Phase-One Paper



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Present status

- ✓ Physics benchmark studies of highlighted P1 studies in progress…
- ✓ Paper status: rough outline with various pieces of text/pictures uploaded

Items discussed last time

- ✓ Sell PANDA P1 program as a whole and not as individual pieces.
- ✓ "Physics potential part" ONLY includes aspects that make sense to do in P1.
- ✓ No discussion on day-one risk assessment; GEM + forward trackers included.
- ✓ Bottom-up: first focus on contents, then fine-tune introduction.
- ✓ TAG indicated to be willing to help in intro and theory part.
- ✓ Software: we do not strict ourselves to usage of day-one release, although strongly advisable; ideal forward tracking, partly ideal PID; …
- ✓ One common memo for phase-one paper to be reviewed according to rules.
- ✓ Sum rule check: total amount of integrated luminosity for our ambitions?

Core topics for phase-one paper

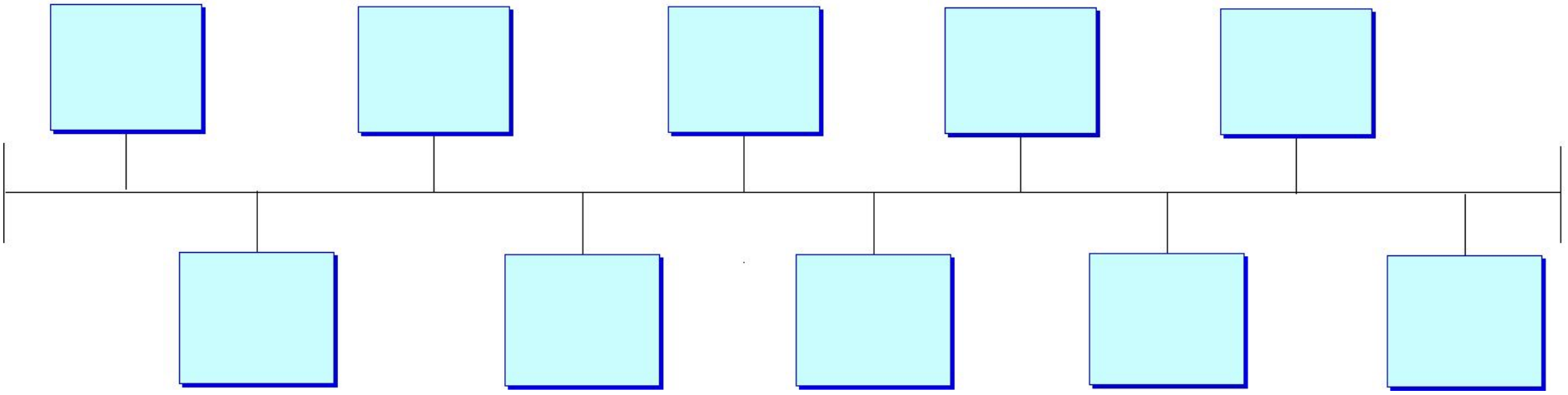
- **Physics potentials for phase-one:**
  - Nucleon structure: EMFF in time-like and unphysical regime.
  - Hyperon production dynamics: spin degrees of freedom (Lambda, Cascade).
  - Baryon structure: S=2 spectroscopy, Cascade excitations.
  - Hadrons in nuclei: antihyperons in atomic nuclei.
  - Charmonium(like) spectroscopy: line-scan capabilities (X(3872))
  - Light-hadron spectroscopy: gluonic excitations???

Items to be discussed

- **For each physics item:**
  - What is the key example that you like to highlight for the paper?
  - What will be measured of this highlight benchmark at P1?
  - What is the predicted precision/accuracy?
  - What key figure(s)/table(s) would be suited to present in the paper?
  - What is the minimum integrated luminosity needed at which energy?
  - What will be the impact, e.g. why does the community care?
  - Competition?
  - Why do we need to study this at P1?

How to proceed?

- ✓ Internal reviewing process? Cross-reviewing among convenors? Memo?
- ✓ Communication with TAG? Introduction? Reviewing?
- ✓ Timeline?



Topic	Observable	Beam momentum	Subscription
Charmonium			
hc scan	xsecs	scan: 5.6 GeV/c	no subscription
Angular chi_c(1,2) distributions	diff. xsecs	5.54 and 5.72 GeV/c	no subscription
High spin 3D2 state	diff. xsecs	3.678 GeV/c	Zhiqing Liu / Mainz
Charmonium Exotics			
X(3872) energy scan	xsecs	7 GeV/c	GSI
X->Z(3730) transition	branching fraction		FZJ
X(3872) open-charm decays	branching fraction		JINR
Zc(3900) production in pbar+d	xsecs		NSU
Heavy-light Systems			
DDbar production	(diff) xsecs	>6.5 GeV/c	KVI-CART/FZJ
Hyperons structure			
Cascade and Omega spectroscopy	missing states, branching fractions, JP	~4 to ~9 GeV/c (various dep. on specific state)	FZJ, Bonn
Hyperons dynamics			
Lambda-Lambdabar	(diff) xsecs, pol. pars	1.64 GeV/c	Uppsala
Cascade-Cascadebar	(diff) xsecs, pol. pars	4 GeV/c	Uppsala
Omega-Omegabar	(diff) xsecs, pol. pars	7 GeV/c	Uppsala
Light-meson spectroscopy			
XYZ in light-quark sector: Y(2175)	xsecs (PWA)	3.75 GeV/c	no subscription
light glueball searches: G->...	xsec, PWA	3.75 GeV/c	no subscription
tensor glueball searches: ppbar->phi phi scan	xsecs, PWA	scan: up to 2.7 GeV/c	no subscription
KKpi molecule: a1(1420)->3pi in ppbar -> 4pi	xsecs, PWA	3.75 GeV/c	no subscription
Time-like FF			
EMFF in ppbar->e+e-	GE, GM, R	~up to 4 GeV/c	Mainz/Orsay
EMFF in ppbar->mu+mu-	GE, GM, R	~1.5 GeV/c	Mainz/Orsay
EMFF in unphysical regime	GE, GM, R, phase	parallel to XYZ studies	Mainz/Orsay
Hard exclusive processes			
ppbar->gg	GDA		no subscription
ppbar->gpi0	GDA		no subscription
Hadrons in nuclei			
Hyperon - Antihyperon production	Ybar potential	1.6 GeV, 2.9 GeV	Mainz
Color transparency	nuclear CT for various mesons and p, pbar	~8 GeV/c, up to 15 GeV/c for p, pbar	Gauhati (prelim)
Short range correlations	nucl. high mom. pn, pp, N-Delta and Delta-Delta SRC	~8 GeV/c	FZJ
Delta-Delta component in deuteron	(p pi+) (pi- pi-) with large pz gap	~8 GeV/c	FZJ