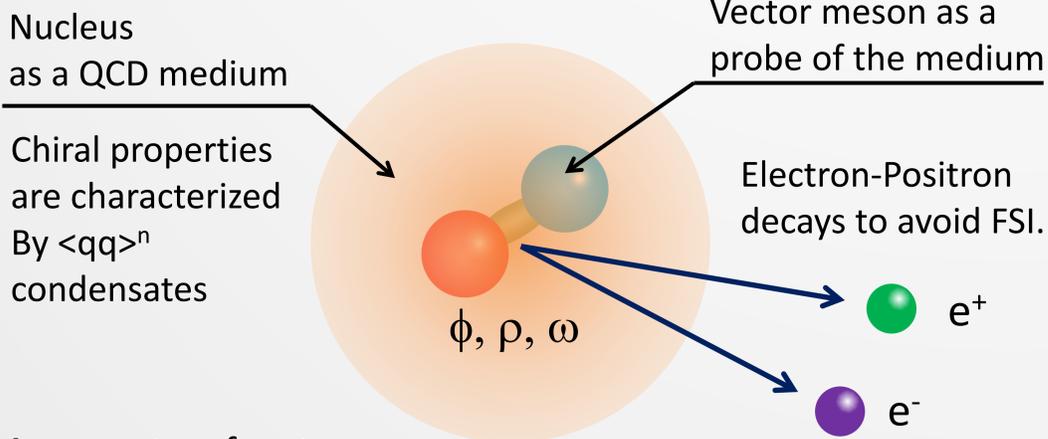


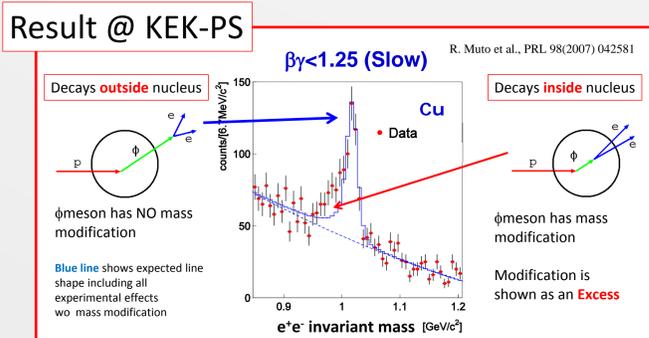
NEW BEAM LINE AND EXPERIMENTS AT J-PARC

PHYSICS OPPORTUNITY

Chiral symmetry and nuclear medium

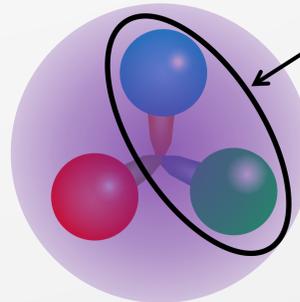


Mass spectra of vector mesons and amount of the condensates are strongly correlated. cf. QCD sum rule
Hatsuda and Lee, PRC 46 R34



Di-quark Correlation

Light quark baryon



Di-quark correlation in a baryon are suggested.

Experimental information, such as Regge trajectory, supports di-quark. However, it is difficult to study di-quark in light quark baryons due to other effects.

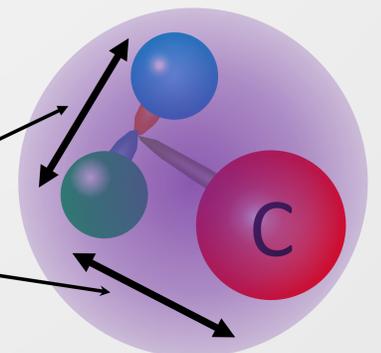
Charmed baryon excited states

Following two excitation will be distinguished.

Di-quark excitation

Charm - qq excitation

Detailed study of level structure is a key measurement.



high momentum and high intensity secondary beam and missing mass spectroscopies are suitable.

THE NEW BEAM LINE

Multi-function beam line

- Primary 30 GeV proton beam, 10^{10} per spill
- Unseparated secondary beam, up to 20 GeV/c, 10^8 per spill
- COMET Beam, 8 GeV, 1.5×10^{13} proton/sec (3kW)

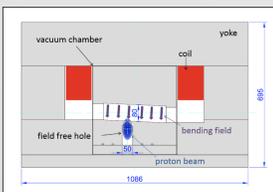
Protons from acc.

KEY COMPONENTS

Branching point

A "Lambertson type" magnet is used at the branching point.

Very small fraction (10^{-4}) is branched. Main beam goes through no magnetic field region.

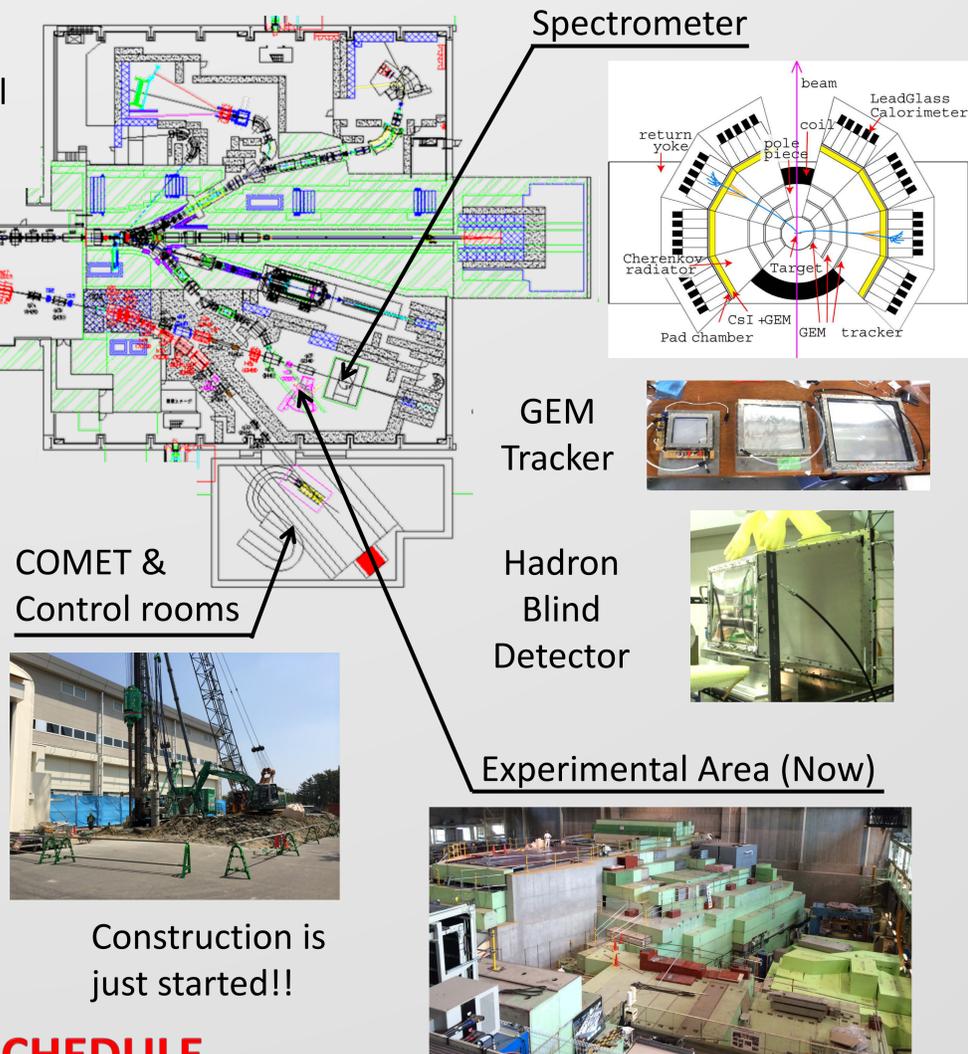


Magnets in Switch Yard



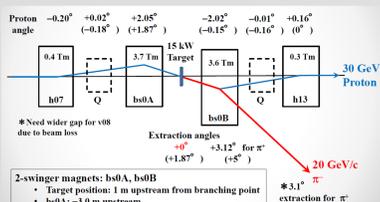
New Line

Part of beam line magnets for the new beam line are already placed at the right place!!



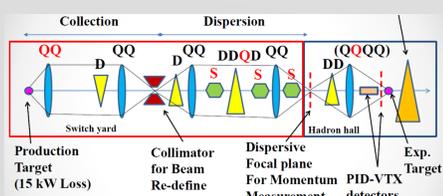
Construction is just started!!

FURTHER UPGRADES FOR SECONDARY



Production Target and a smart extraction scheme to achieve a high intensity (10^8 per spill @ 20 GeV/c)

Dispersive focal plane method to achieve a good momentum resolution ($\Delta p/p \sim 0.12\%$)



SCHEDULE

Construction of the beam line will be finished in two years. The first experiment (J-PARC E16) will start in early 2016.

SUMMARY

A new beam line is under construction at J-PARC Hadron Facility to deliver high momentum primary and secondary beams. New experiments to investigate nuclear chiral property and di-quark correlations are under preparation.

K. Ozawa (KEK) for the J-PARC High-p collaboration