

FIRST IDEAS FOR THE LHEC PAPER

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LHEC PHYSICS COORDINATION

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MANDATE:

- **TITLE:** “The Physics Program of the LHeC”
- **SCOPE:** SUMMARY OF THE PHYSICS POTENTIAL AND IMPORTANCE
- **SIZE:** 20-30 PAGES
- **SCHEDULE:** FIRST DRAFT BY NEXT SESSION OF IAC - SPRING 2015

TENTATIVE SUMMARY

A FIRST PROPOSAL

- **Introduction** (1-2 pages):
 - general motivation, history and background
 - machine and detector specifications (energy, luminosity, kinematic coverage)
- **PDFs** (6-8 pages):
 - determination of individual PDFs w/ comparison to LHC
 - impact on LHC processes/searches
- **Higgs** (4-5 pages):
 - VBF
 - coupling to heavy quarks
- **Top** (3-4 pages):
 - top properties
 - top partners
- **BSM** (4-5 pages):
 - contact interactions
 - SUSY
- **Low x & eA** (4-5 pages):
 - saturation
 - diffractive PDFs and GPDs
- **Executive Summary** (1 page)

MAX: 30 PAGES; MIN: 25 PAGES

SUGGESTIONS FOR STYLE

A FIRST PROPOSAL

- ADOPT COMMON STYLE IN ALL SECTIONS
- BETTER TO HAVE ONE LESS TOPIC THAN A WEAK TOPIC
- HALF-PAGE EXECUTIVE SUMMARY IN THE BEGINNING OF EACH SECTION
- BETWEEN TWO AND FOUR “KILLER” PLOTS FOR EACH SECTION
REMOVE TOPICS WITHOUT KILLER PLOT
- CONCENTRATE ON UNIQUE FEATURES, BE QUANTITATIVE
EXAMPLE: COMPARE PDFs TO LHC, NOT TO HERA
- EMPHASIZE COMPLEMENTARITY WITH LHC
EXAMPLE: ESTIMATE IMPROVEMENT OF DISCOVERY LIMITS THANKS TO BETTER KNOWLEDGE OF PDFs