Introduction to BSM session

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5 November 2019
BSM session of PBC working group meeting
5-6 November 2019

- Main goal is to review the status of projects
- Additional input to European Strategy Update drafting session in January 2020
- Agenda on [https://indico.cern.ch/event/827066/](https://indico.cern.ch/event/827066/)
- BSM sessions: 5 November 2019 14:00-18:00
  - 6 November 2019 9:00-12:00
BSM sessions 5-6 November 2019

• Talks on the progress of the projects since January 2019, which is important to deliver to European Strategy Update
  – Requests for talk from the projects
  – Requests from the community and PBC coordination to clarify specific questions and discussions

• No interest to repeat the presentations from PBC in January 2019 and documented already in BSM Working Group Report (arXiv:1901.09966) and accepted in Journal of Physics G

• No new document to be produced, the deliverables will be the talks and documents uploaded on INDICO site

• New updated sensitivity plots (thanks to Gaia) are available on the site: https://indico.cern.ch/event/859323
BSM Projects presented in January 2019 and with updates at this meeting

• BabyIAXO:
  – Physics Review Committee of DESY endorsed BabyIAXO proposal
    https://gifna.unizar.es/iaxo/?p=1010

• CODEX-b
  – EOI for 2019, include light hadron decays

• SHIP
  – muon flux and charm measurements, BDF Yellow Book contribution, Comprehensive Design Study (CDS) end of 2019

• NA64
  – cover significant part of $^8$Be anomaly, visible Dark Photon modes

• KLEVER - expression of Interest in preparation for CERN SPSC

• REDTOP – better background rejection due to better simulation

• LDMX - progress in detector design, on accelerator session eSPS

• FASER
  – approved by CERN LHCC and Research Board

• MATHUSLA - Physics Case published, revision: arXiv:1806.07396
BSM Projects in arXiv:1901.09966 and presenting updates at this meeting

- AWAKE++ (was in accelerator session in January 2019)
- MDM/EDM of heavy baryons and tau lepton
  - Include tau, workshop in Milano 3-4 October 2019
    [https://agenda.infn.it/event/19523](https://agenda.infn.it/event/19523)
- milliQan
  - news from simulations and demonstrator
New BSM Projects

- **ANUBIS**
  - Proposal to search for long-lived neutral particles in CERN service shafts

- **XSEN**
  - LHC neutrinos with emulsion detector
BSM Reviews

• In accelerator session: Beam Dump Facility (including TauFV and PASSAT)
• LLP at LHC (James Beacham)
  – LLP workshop May 2019 [http://indico.cern.ch/event/792346]
• Feebly Interacting Particles: what’s new since January 2019 (Gaia Lanfranchi)

Fermion Portal: HNL coupled to the second lepton generation (BC7)

New:
- T2K, off-axis ND280, 2010-2017 dataset, (12.34x10^{20} pot (ν-mode) and 6.3 10^{12} pot (anti-ν mode))
- NA62 in kaon mode, preliminary
  1.2x10^{17} K^- decays in FV (30% of 2016-2018 dataset)
  [Goudzovski, KAON2019]

T2K has similar performance as E949, NA62 slightly worse
Both can improve in the coming years.