FOREWORD

The 2021 International Particle Accelerator Conference (IPAC'21) took place as a fully virtual conference from May 24 to 28, 2021. It was originally planned to be a face-to-face Conference in the beautiful city of Iguassu Falls in Brazil, but, due to travel restrictions imposed by the covid-19 pandemic, the Organizing Committee (OC) supported the virtual format, as was already the case for IPAC'20 in Caen, France, for the same reason. IPAC'21 was organized by the Laboratório Nacional de Luz Síncrotron (LNLS) in Campinas, Brazil, the site of the newly commissioned 4th generation storage ring synchrotron light source facility Sirius.

IPAC is hosted annually and typically attracts more than a 1000 accelerator scientists and engineers from all around the world. It is the main international event to discuss the latest achievements in the science and technology of Particle Accelerators, promoting collaboration among scientists, engineers, technicians, students, and industrial partners across the globe. It is also the primary forum for conference publications in particle accelerator related fields, through the international JACoW collaboration.

Given the conference would be virtual, the IPAC'21 OC endeavored to replicate the scope of an in-person conference as much as possible including invited and contributed talks, poster sessions, topical forum and an awards session, and industrial exhibitors. To try and achieve these goals, the Whova platform was selected for hosting the virtual conference. The agenda featured 2 hours of live programming each day in a time window that allowed worldwide participation. Live plenary talks and live Q&A sessions with invited and contributed speakers were accommodated in this time window. The invited and contributed talks were pre-recorded and made available for watching and commenting prior to the live Q&A sessions. Poster sessions were each provided a teleconferencing link for several hours of live discussions. About 400 poster rooms per day were available from Monday to Thursday.

Several highlights from the conference include plenary talks on the scientific capabilities of 4th generation storage ring light sources by Harry Westfahl, Jr. of the LNLS, the newly commissioned Facility for Rare Isotope Beams at Michigan State University by Thomas Glassmacher, a talk on the future of high power FELs from Norbert Holtkamp at SLAC, a survey of the current state of RF photocathode guns by Houjun Qian of DESY, and a talk on future directions in particle physics in the US by Young-Kee Kim of University of Chicago. There were several topical sessions including a session on Women in Science and Engineering (WISE) that featured a talk entitled "Women in Science: The Inconvenient Truth" from

Marcia Barbosa from the Universidade Federal do Rio Grande do Sul, an industrial forum hosted by Raffaella Geometrante from KYMA that focused on the intersection of government accelerator projects and industry featuring Eric Colby of the US Dept. of Energy, David Bruhwiler of RadiaSoft, and Paolo Manini from the SAES Group. The closing plenary was a sobering presentation on interaction of climate change and the Brazilian Amazonia region by Paulo Artaxo from the University of São Paulo.

The conference was highly successful and attracted over 1750 participants from around the world. Despite the technical and logistical challenges of a global virtual conference, the virtual platform provided many advantages. The relatively low registration fee ($120-$160) and zero fees for students allowed a much higher attendance than an in-person conference and also attracted a large number of early career and student attendees as well as attendees from countries typically not represented at IPAC. The virtual platform also allowed the spontaneous creation of over 60 chatrooms with discussions on technical topics to job postings (over 100 jobs posted!) The high quality of pre-recorded talks allowed every attendee to have a front row seat and to watch interesting talks multiple times. The practice of audience questions coming in via chat was particularly successful and led to more active discussions than an in-person meeting. The virtual format was less than optimal for industrial exhibitors.

It was important also to include publication of the proceedings in the conference planning. The processing of the electronic manuscripts is traditionally done on-site by the JACoW Team, in a well-established system in which several expert editors train the new ones. All are volunteers from various laboratories worldwide. The face-to-face teamwork has become so effective that the final version of the conference proceedings has been published just a few days after the conference. In the virtual edition the JACoW team can't meet in-person and the proceedings publication becomes a challenge. For IPAC'21 we adopted a system in which only one in-house expert editor coordinates a team of local newbies hired for this purpose. The editing work was planned to last nearly 3 months.

These proceedings contain the reports of 1246 total papers. They contain the latest developments in our field of particle accelerators, with contributions from participants from 33 different countries and 238 different institutions, demonstrating our field is active during these critical times.

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