

Introduction

April 1, 2020 – March 31, 2021

Progress in research and operations at the Texas A&M Cyclotron Institute is summarized in this report for the period April 1, 2019 through March 31, 2020. The period covered by this report was unprecedented as the COVID-19 pandemic raged world-wide. The CI continued operations throughout this time with new procedures to ensure that we could run as safely as reasonably achievable. In the beginning of this period, operations were limited to the radiation effects program due to its importance to national security. While operations for the discovery science portion of the program was put on hold initially, we were able to resume full operation during the summer with new procedures that limited access to the operations portions of the building and reduced person density throughout the facility. In February Texas experienced an extreme weather event, which caused significant damage to infrastructure throughout the state and here on campus. Due to heroic efforts on the part of our operations staff the cyclotrons survived with minor issues and only about 2 weeks of lost running time. The CI has had a remarkably productive year despite the circumstances and I am indebted to the dedicated operations staff that kept the facility running during this challenging period.

The K500 provided 4129 hours of beam for both science and radiation effects testing despite the pandemic, which caused an enormous problem with handling unscheduled maintenance issues. A particular issue occurred in November with the catastrophic failure of the twenty-five-year-old ECR ion source servicing the K500 cyclotron. Luckily, a new ECR ion source was in the final stage of assembly. In this reporting period, 1544 hours of beam time was lost to unscheduled maintenance. The K150 cyclotron provided 3767 hours of beam on target and continues to be used by external customers for radiation effects testing with its proton and 15 MeV/u heavy-ion beams, two of which are newly developed.

The format of this report follows that of previous years. Sections I through IV contain reports from individual research projects. Operation and technical developments are given in Section V. Section VI lists the publications with Cyclotron Institute authors and outside users and the Appendix gives additional information including talks presented by members of the Institute during the past year. Once again, the full volume of this year's Progress in Research is available only on our web site (<http://cyclotron.tamu.edu>). Since most of the contributions presented here are truly reports on progress in research, results and conclusions should not be quoted from the report without the consent of the authors.

I am indebted to Dr. Y.-W. Lui for assembling this report.

S.J. Yennello
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