

Parameters of an RF cycle for Au⁷⁹⁺ and p

D. P. Deng

January 1993

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-76CH00016 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

RHIC Project
BROOKHAVEN NATIONAL LABORATORY

RHIC/RF Technical Note No. 5

Parameters of an RF Cycle for Au^{79+} and p

D. P. Deng

January 1993

Parameters of an RF cycle for Au^{79+} and p

D.-P. Deng

RHIC

Brookhaven National Laboratory

Upton, NY 11973

January 11, 1993

Abstract

A longitudinal emittance $0.30 \text{ eVs}/u$ is assumed. Major parameters (bunch length, bucket area, bucket length, synchrotron frequency *etc.*) of gold and proton cycles are calculated and plotted throughout the acceleration cycle.

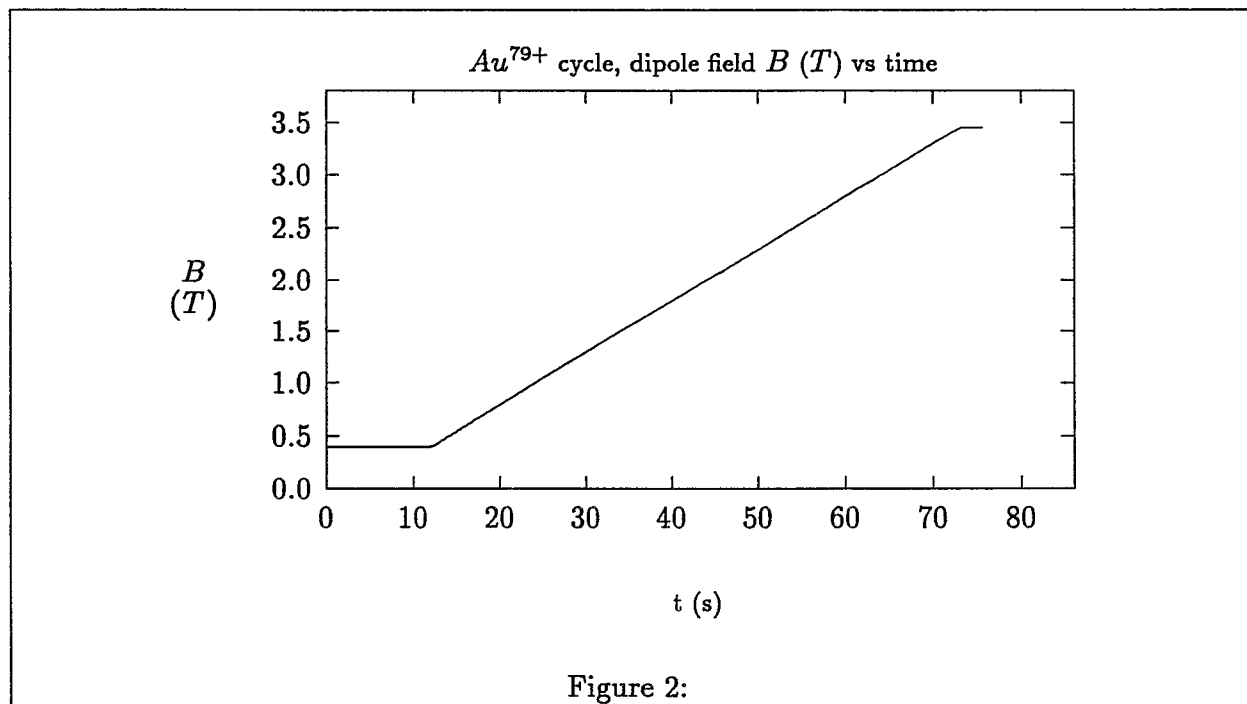
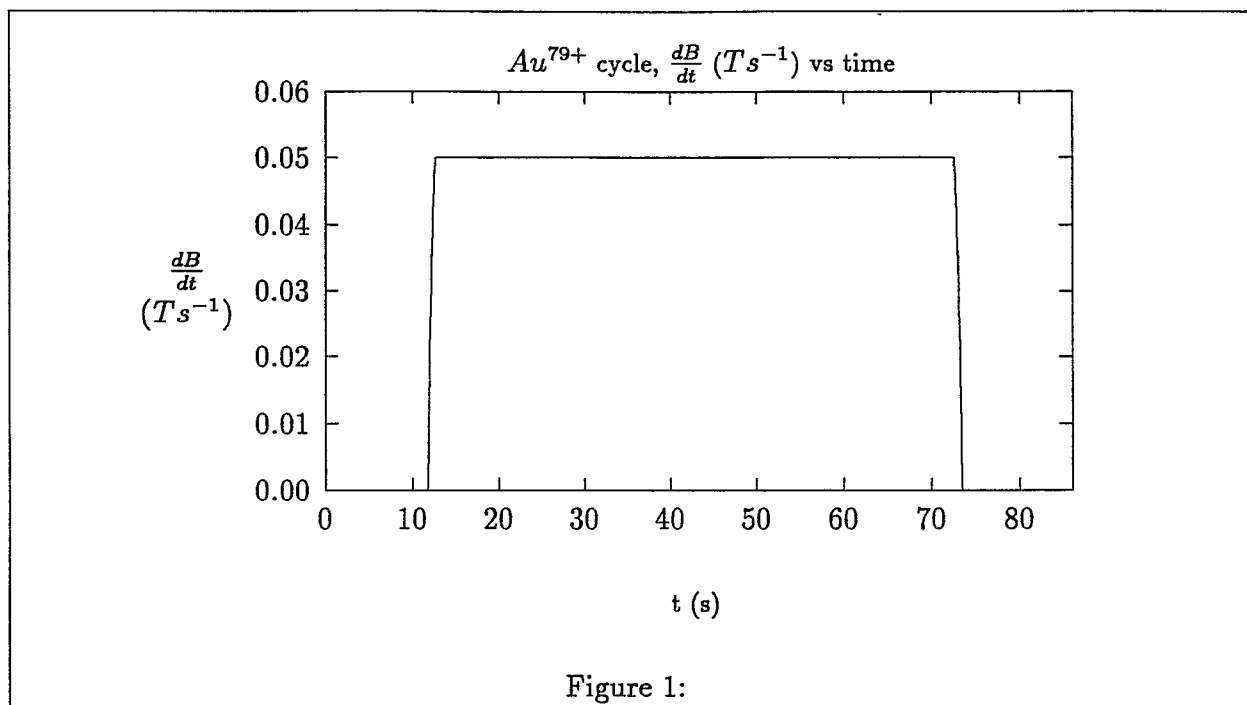
1 Introduction

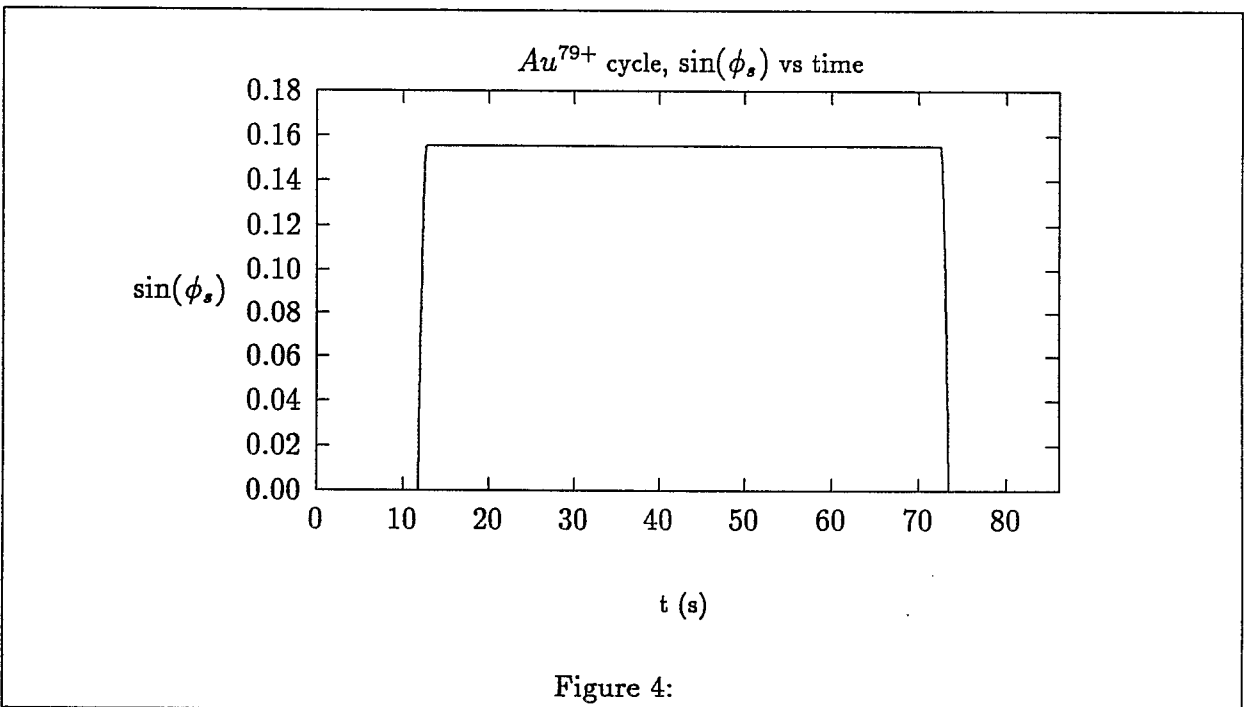
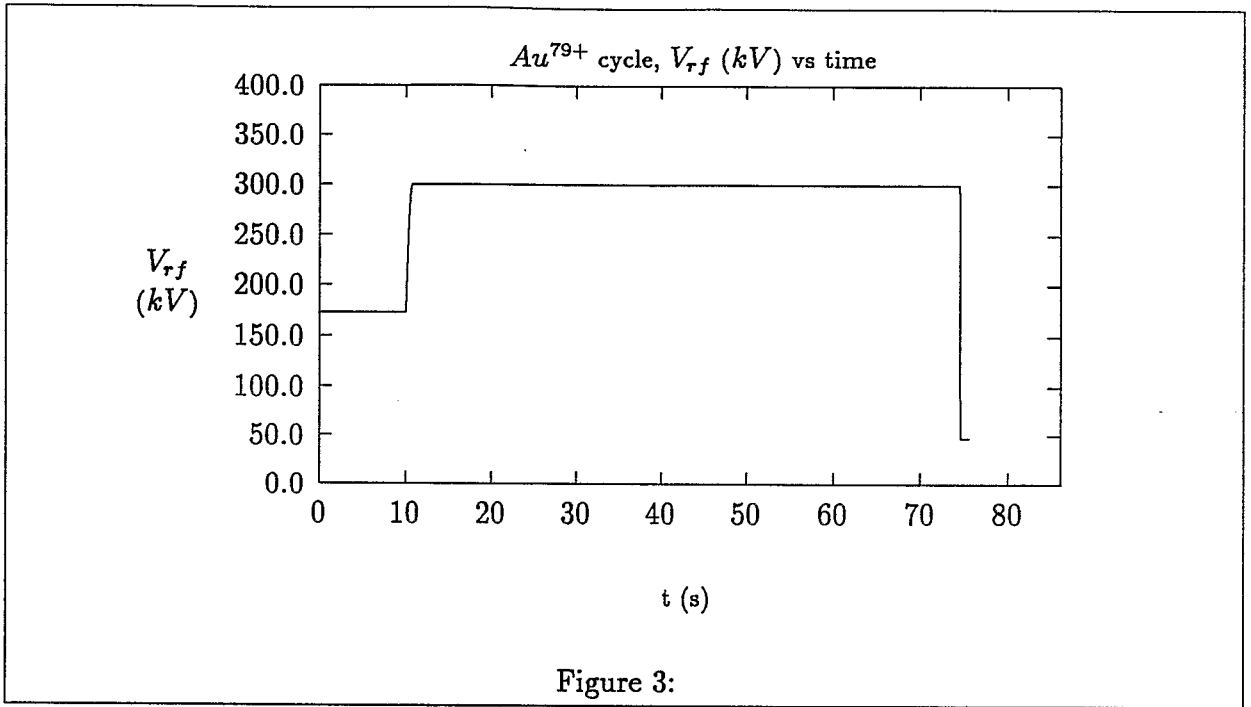
The cycle used here starts from a few second before acceleration, ends prior the beam being transferred from accelerating cavities to storage cavities. The gold beam goes through transition, and experiences a γ_{tr} jump. The proton does not go through transition. Since the nominal matching voltage for proton is too low, a bunch rotation is assumed and the bunch length is reduced by one half in *AGS*.

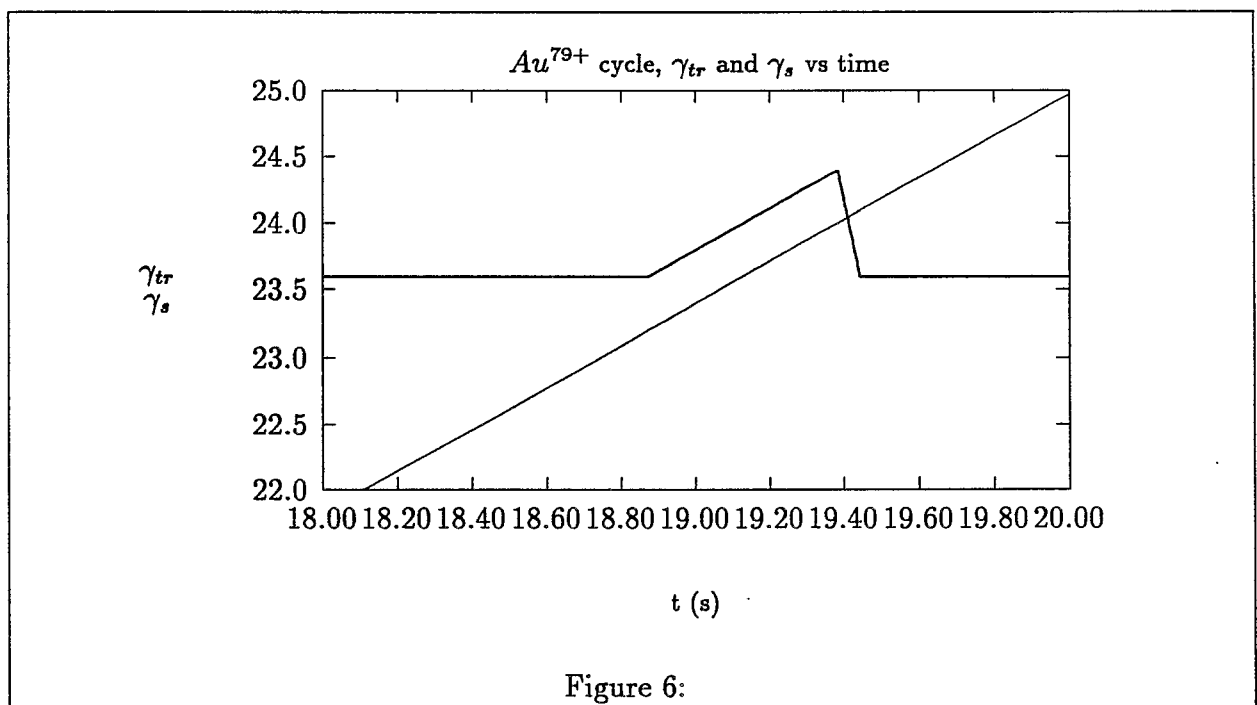
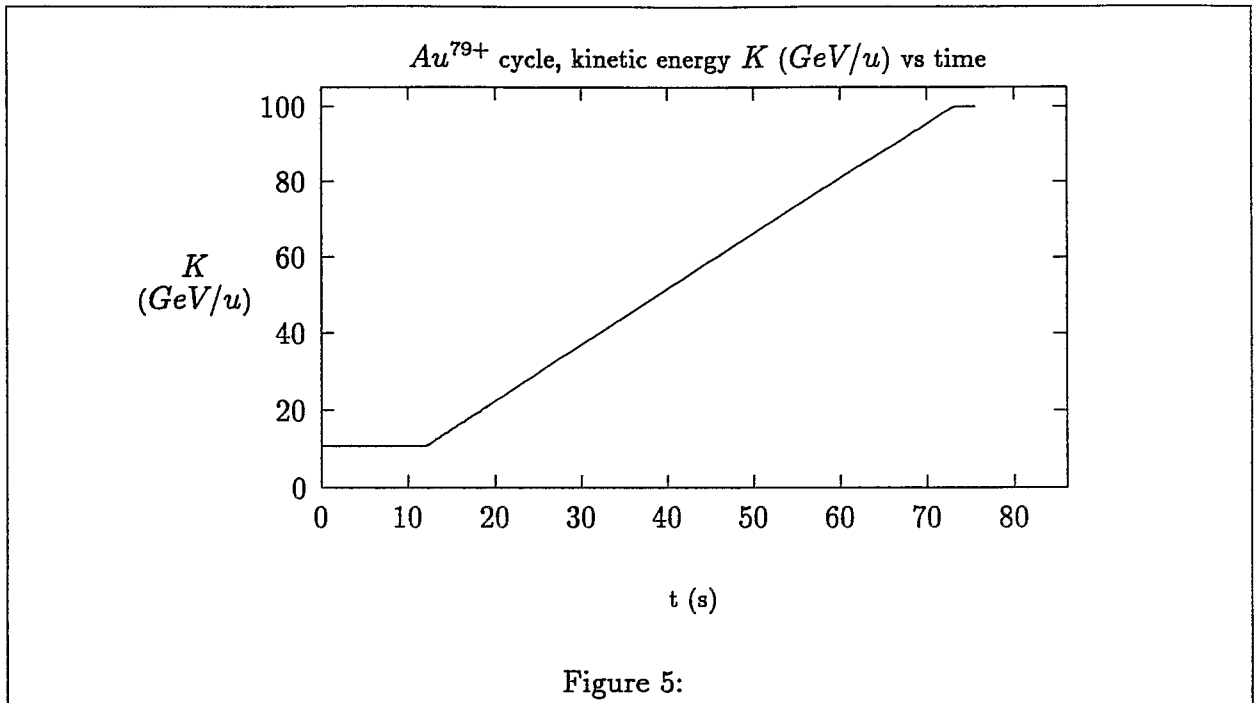
The ramp between two plateau is connected by a quarter period of *sine* wave form. For instance, the V_{rf} is ramped up from matching voltage to acceleration volts or ramped down to make a bunch rotation; \hat{B} is ramped from zero to its maximum value.

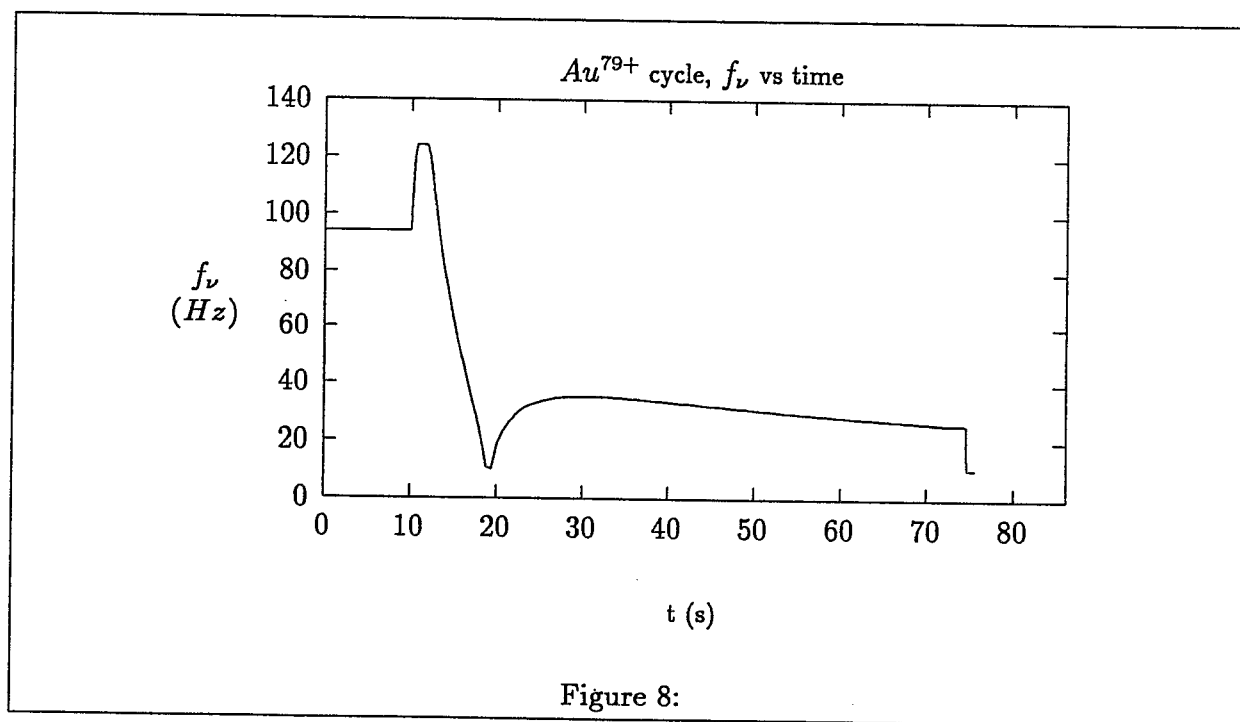
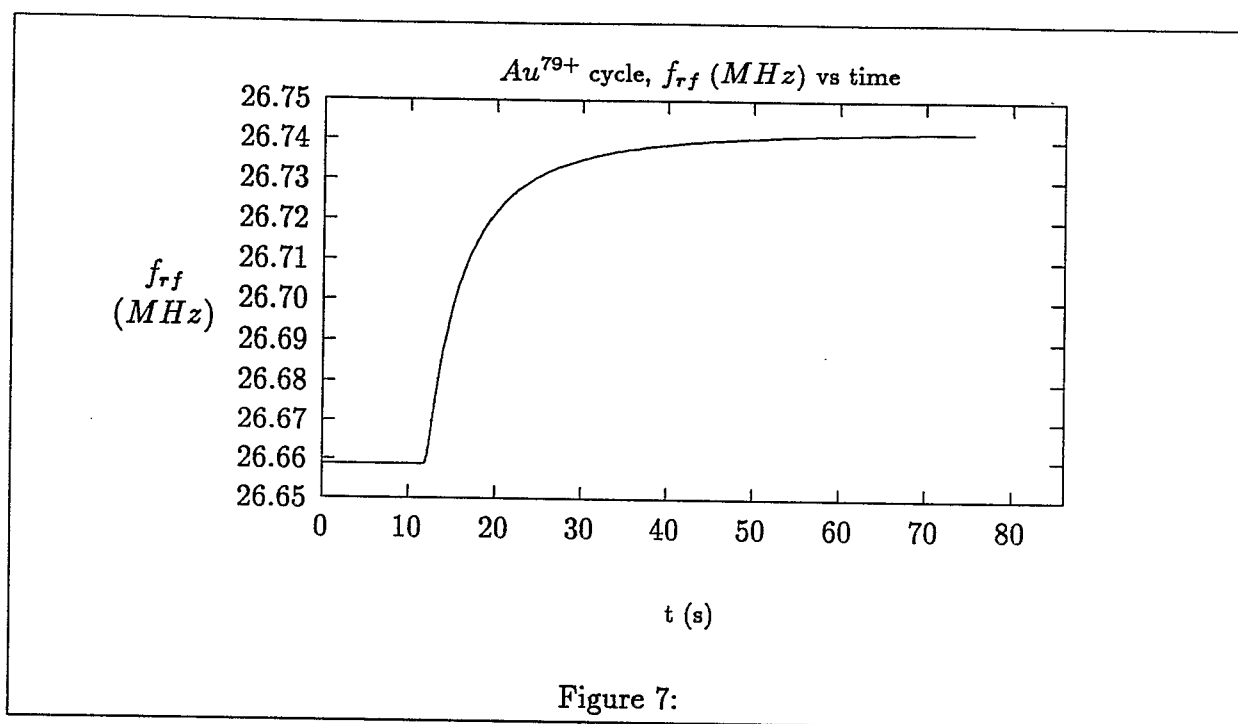
Note that excluding the region of γ_{tr} jump, γ_{tr} is taken as 23.6. Small changes in the value of γ_{tr} have little effects on the overall results.

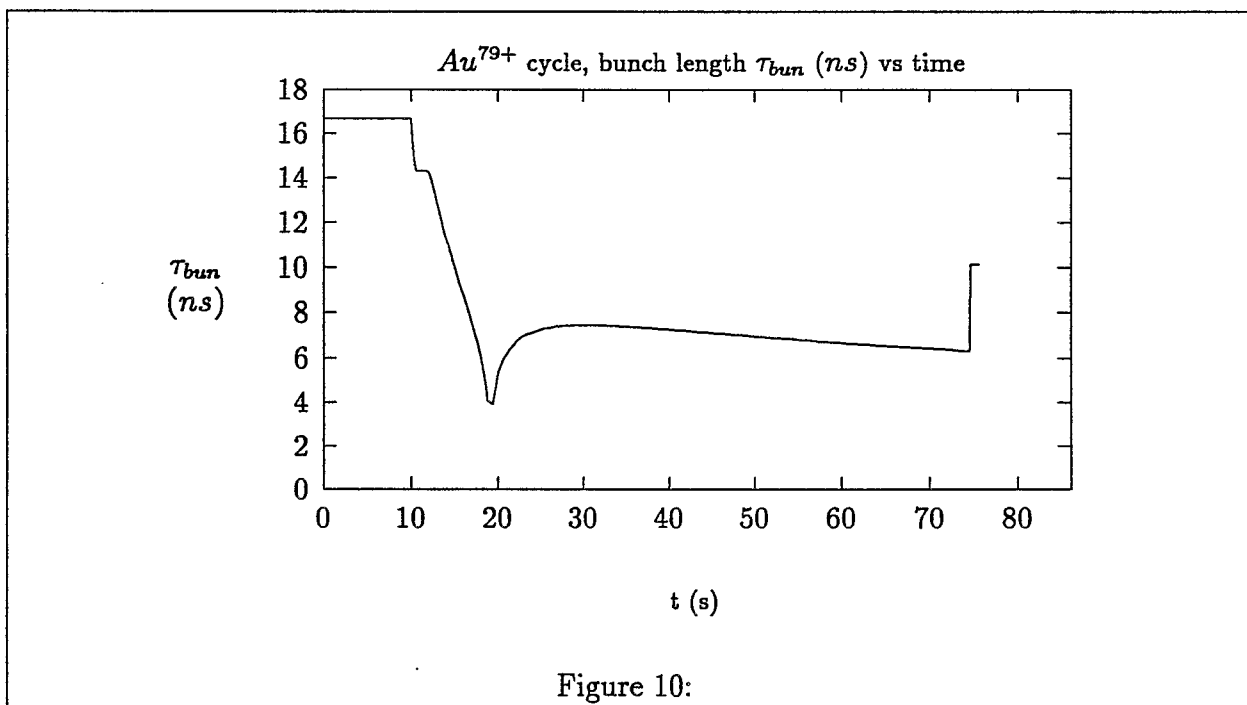
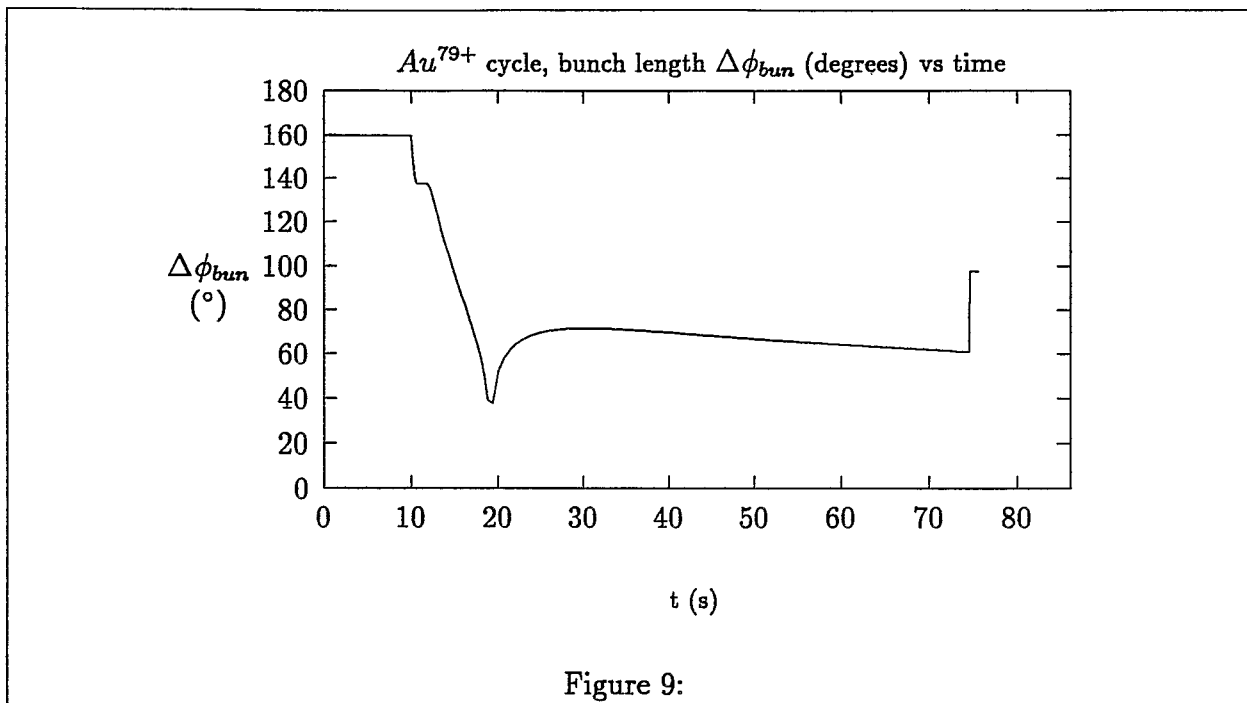
2 Au^{79+} cycle

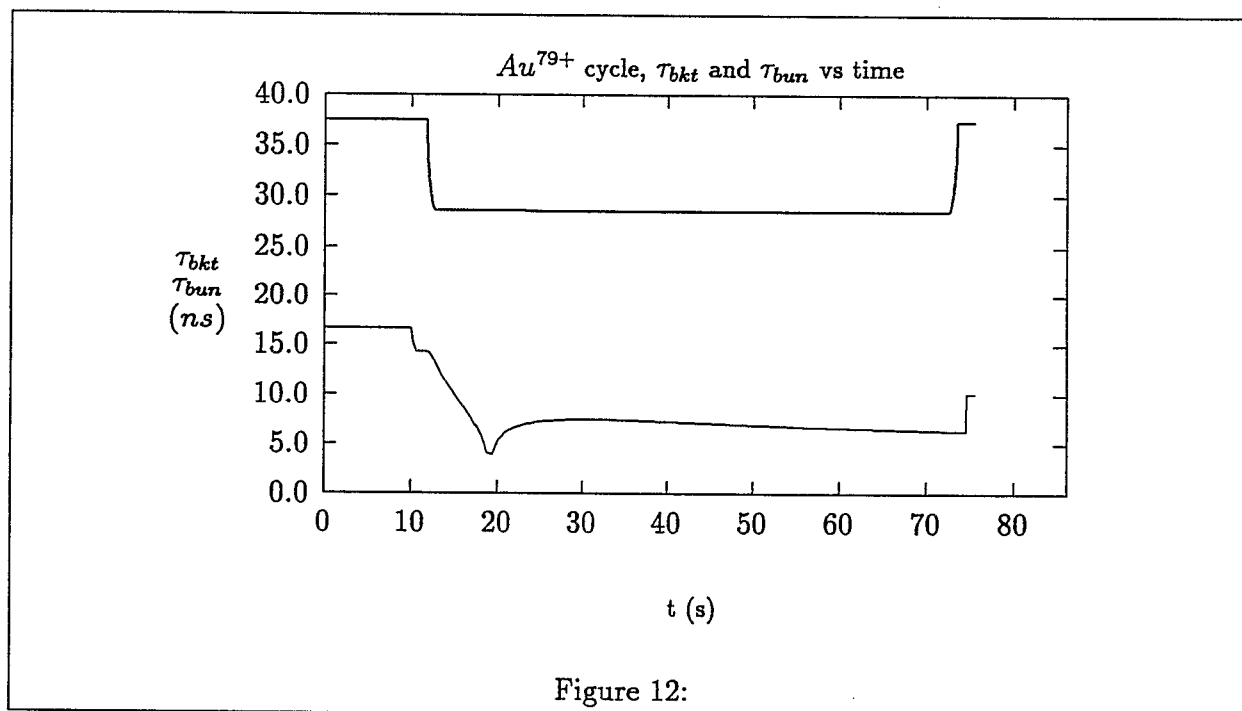
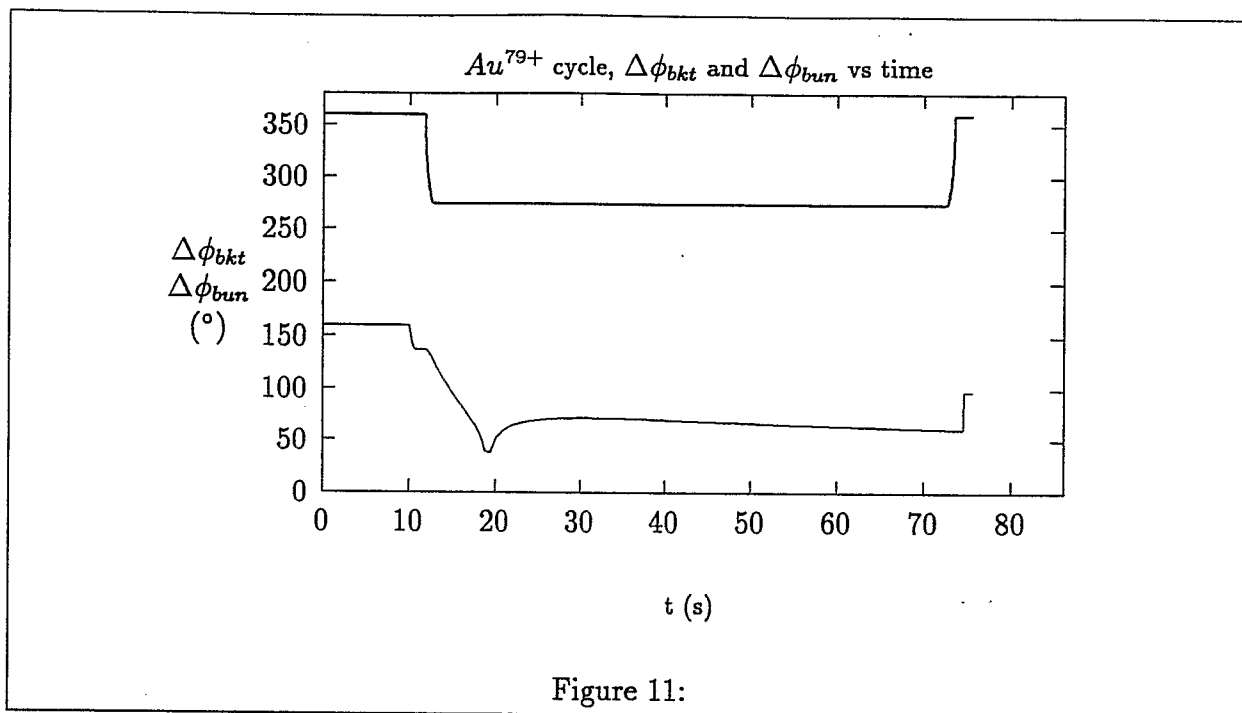












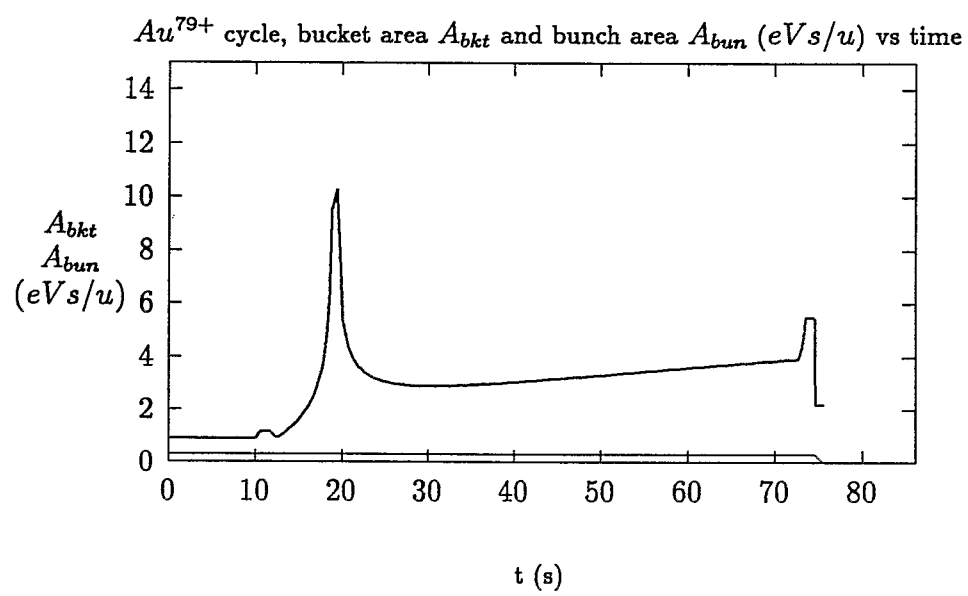


Figure 13:

3 p cycle

