

COCU - A CLOSED ORBIT CORRECTION PACKAGE FOR SPS AND LEP

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Abstract

The closed orbit correction package COCU (Closed Orbit Correction Utilities) was built for SPS and LEP using well known techniques and algorithms [1,2]. The procedures are driven by input data and no assumptions on the machine are made, allowing its application to any circular machine and it is now used at various accelerators in the world in identical form [3]. It is written in an entirely modular form, thus allowing to implement additional algorithms easily. The sequencing of the logically independent modules is done by a sequence of commands, each of which initiates a well defined action. Examples for such actions may be the handling of input and output, definition of the desired algorithms, preparation of the input for the algorithms etc. An important issue was to define a well defined data interface, independent of the machine, operating system or programming language [4]. This interface is used inside the program to communicate data between the modules as well as for communication with other processes, such as data acquisition or man machine interface. A most critical aspect was the speed of the program. At LEP with its more than 500 beam position monitors and 300 correctors in each plane, COCU is run in a semi-automatic way, resulting in more than 10000 complete runs per month of LEP operation. Typically a calculation must not take longer than 1 to 3 seconds. For the future LHC an orbit feedback is foreseen during the ramp with a bandwidth in the order of 1 second, a goal which we believe is well in reach with our approach.

The basic design principles are presented together with an overview of the main algorithms and techniques with a bias towards those which are most frequently used at LEP and SPS [5].

References

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- [4] "MOPS - A Data Management System for the LEP/SPS Control System", W. Herr, CERN/PS/89-9 (AMS) and Proc. Part.Acc.Conf. 1989, Washington D.C.
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