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Development of Diagnostic Tools to Optimize the Injection Efficiency at ALBA

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The injection efficiency is an important parameter for synchrotron light sources operating in top-up mode like the 3.0 GeV ALBA synchrotron light source located in Barcelona, as the Storage Ring (SR) is periodically refilled with the Front Ends open while the users take data continuously. A bad transmission makes injections longer and compromises data collection during refilling. At ALBA, the transfer efficiency from the Booster to the SR had always been an issue as it was not as stable as expected and to keep it at adequate levels was a time consuming operation. Hence, the Operations section together with the Beam Physics section has successfully completed a project consisting of the improvement of the available diagnostics to be able to properly align the beam in the Booster-To storage ring (BT) transfer line, and the development of high-level software tools to control the BT transmission. Thus, now the operators have the means to properly diagnose and correct the specific causes of the injection efficiency variations coming from the BT. Finally, a standard operating procedure has been defined to optimize and recover the BT transmission, allowing to react faster and keep it above 80% in routine operation.

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