INTRODUCTION
ALBA is a 3 GeV, 400 mA, 3rd generation Synchrotron Light Source
The RF System provides up to 3.6 MV of accelerating voltage and restore up to 540 kW of power to the electron beam.
Six RF plants, working at 500 MHz, are installed.
The RF plants include several new developments:
1) DAMPY cavity
The normal conducting HOM damped cavity developed by BESSY and based in the EU design.
2) CaCo & CoStub
A cavity combiner to add the power of two 80 kW IOT’s.
3) WATRAX
A waveguide transition to coaxial, specially designed to feed the DAMPY cavities due to the geometrical and cooling constrains.
4) Digital LLRF
Customized for the ALBA accelerator.
5) Transmitters
A total of 14 IOT based transmitters providing 80kW each one.

STORAGE RING RF SYSTEM

TRANSMITTER
Tube type IOT
Number 6 x 2 IOTs
Power 2 x 80 kW
Combination CaCo

IoT amplifiers
A total of 14 IOT based transmitters are used in ALBA:
• 1 for the booster accelerator
• 12 for the storage ring
• 1 for the high power RF test laboratory

IoT’s are the main component of the transmitter. They provide 80kW of RF power in CW with a maximum efficiency of 70%.
A solid state preamplifier transforms the 2 mW output signal of the DLLRF in up to 500W, which are needed to drive the IoT to its full power.

Control system
The control and supervision system checks all the operation parameters of all the components of the RF plant and cuts power instantly in case of malfunction.

DAMPY
6 RF cavities delivering each one 600kV (90kW) to the electron beam.

WATRAX
Waveguide to coaxial transition for the DAMPY cavities

Digital LLRF
Based on downconversion and digital IQ modulation-demodulation technique. Implemented using commercial components.

CaCo & CoStub
CaCo combines the power of two 80kW amplifier.
CoStub replaces the coaxial between CaCo and the IOT’s and allows to short-circuit the waveguide when working only with one IoT.

The ALBA Storage Ring RF System
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