

Log-Ratio Beam Position Monitor

Alexander Kalinin

Bergoz Instrumentation
Espace Allondon Quest 156, rue du Mont Rond
01630 Saint Genis Pouilly France

Abstract

The Log-Ratio BPM (LR-BPM) newly designed at Bergoz Instrumentation, can be used to measure position of single short bunch, bunch train, successive and repetitive (circulating) bunches/trains. It has four parallel channels with bandpass filters and logarithmic demodulating high dynamic range amplifiers. The amplifiers detect the envelopes of the RF bursts brought about by the pickup signals in the filters. Log-Ratio processing as well as conversion of the pickup axes to X,Y is done using broadband analog technique. The X,Y output signals can be taken as continuous, Sample&Hold and Track&Hold ones. In the last two modes, the LR-BPM can be triggered by the beam signal itself. The accuracy limits owing to the inherent demodulator noise, logarithmic nonlinearity, speed of response, etc., of the logarithmic amplifiers available from Analog Devices, are discussed. An accessory developed to determine the LR-BPM resolution and center offset with the present beam signals, is described.