

III. K-3 型相関・一次処理システム

III. K-3 DATA PROCESSING SYSTEM

In the K-3 data processing system, a large amount of data, which are acquired at each VLBI station, are reduced to a delay and a delay rate. These values are used by a data analysis software in order to determine the distance between each of stations, clock offsets and so on.

The K-3 data processing system is composed of data recorders, a correlation processor and two host computers in which a correlation control software and a bandwidth synthesis software are installed. There are two phases, which are correlation process and bandwidth synthesis process, in this system.

In the correlation process, the observed data are synchronously reproduced by data recorders. The reproduced data are cross-correlated at a rate of 8 MHz, twice of the data acquisition rate, and integrated up to 8.38 seconds by the correlation processor. As a result of that, the observed data are reduced to correlated data, the ratio of the reduction is 10^{-5} without any loss of delay information. Then the correlated data are sent to a data analysis computer.

In the bandwidth synthesis process, the correlated data are further integrated, e.g. 4 minutes, and the integrated data of each channel are synthesized in the frequency domain in order to determine precise delay and delay rate. The delay determination error is estimated to be less than 0.1 nsec, that is equivalent to 3 cm in length.

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