Doppler Power Estimator

Medical Imaging DSP Applications Team

1 Description

This module estimates power using 2D zero lag auto-correlation technique. Typically this module is used to calculate the input and output power of the wall filter to compute the signal-clutter ratio. The advantages of the 2D-autocorrelation technique over the 1D-autocorrelation technique are:

- Reduced fluctuations of the power estimate
- Ability to separate flow signals from electronic noise

Project collateral discussed in this document can be downloaded from the following URL: http://www-s.ti.com/sc/techlit/sprs643.zip.

2 Kernel Complexity (C64x+™ CPU cycles, based on CPU cycle accurate Simulator)

-4.1064*D +0.5*D*N +12.4234*(D-M+1) +0.011161*((D-M+1)*M) +53.5885

where

D = Number of samples per scan-line
N = Number of ensembles
M = Number of input samples per output estimate

3 Cycles on TMS320C6455 EVM

The performance is given for several example cases on the C6455 EVM in cycles. The test bench for Color Flow (1D) can be used to find cycles of interest for any other valid configuration.

D	N	Test Case	EVM Cycles per Scan-Line
200	10	7	2709
256	32	8	6223
64	16	18	4175

4 Memory

The following table shows the memory consumption of the dpuPower module.

Memory	Size in Bytes
Program	1088

5 Reference

1. Loupas, T., Peterson, R. B. and Gill, R.W., “Experimental Evaluation of Velocity and Power Estimation for Ultrasound Blood Flow Imaging, by Means of a Two-Dimensional Autocorrelation Approach”, *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, Vol. 42, No. 4, July 1995.

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