

Binary Angle Measurement (4A)

- Redundant CORDIC
-

Copyright (c) 2012 Young W. Lim.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

Please send corrections (or suggestions) to youngwlim@hotmail.com.

This document was produced by using OpenOffice and Octave.

BAM Background

T. Vladimirova, "FPGA implementation of sine and cosine generators using CORDIC algorithm", Proceedings of 2006 MAPLD International Conference

[Bake76] P.W. Baker, "Suggestion for a Binary Cosine Generator", 1975

[Erce87] M.D. Ercegovic, "Fast Cosine/Sine Implementation Using CORDIC Iterations", 1987

[Taka91] N. Takagi, "Redundant CORDIC Methods with a Constant Scale Factor For Sine and Cosine Computation", 1991

[Timm92] D. Timmerman, "Low Latency Time CORDIC Algorithms", 1992

Redundant CORDIC Schemes

[Erce87]
[Taka91]
[Timm92]
[Bake76]

Conversion to/from RSD (Redundant Sign Digit)

Sign evaluation of a RSD number

The Scale Factor is not constant

[Erce87] compensation of the scale factor at the end

[Taka91, Timm92] introduction of special iterations

[Bake76] precomputation of angle rotation

$$\begin{array}{r} +0.2238^\circ \\ \hline = 25.1268^\circ \end{array}$$

Angle Constants that is used

$$Q = \{45^\circ, 26.565^\circ, 14.036^\circ, 7.125^\circ, 3.576^\circ, 1.79^\circ, 0.895^\circ, 0.448^\circ, 0.2238^\circ\}$$

References

- [1] <http://en.wikipedia.org/>
- [2] CORDIC FAQ, www.dspguru.com
- [3] T. Vladimirova, "FPGA implementation of sine and cosine generators using CORDIC algorithm", Proceedings of 2006 MAPLD International Conference
- [4] P.W. Baker, "Suggestion for a Binary Cosine Generator", 1975
- [5] M.D. Ercegovac, "Fast Cosine/Sine Implementation Using CORDIC Iterations", 1987
- [6] N. Takagi, "Redundant CORDIC Methods with a Constant Scale Factor For Sine and Cosine Computation", 1991
- [7] D. Timmerman, "Low Latency Time CORDIC Algorithms", 1992