**MODIFIED PARTIAL PRODUCT GENERATOR FOR REDUNDANT BINARY MULTIPLIER WITH HIGH MODULARITY AND CARRY-FREE ADDITION**

**Abstract:**

Because of its high modularity and carry-free addition, a redundant binary (RB) representation can be used when designing high performance multipliers. The conventional RB multiplier needs for an additional RB partial product (RBPP) row, because an error-correcting word (ECW) is created by both the radix-8 and radix-4 Modified Booth encodings (MBE). This becomes subject in an additional RBPP accumulation stage for the MBE multiplier. A new RB modified partial product generator (RBMPPG) was proposed in this paper; it takes off the extra ECW and hence, it rescues one RBPP accumulation stage. Therefore, than a conventional RB MBE multiplier, the proposed RBMPPG produces fewer partial product rows. Simulation results show that the proposed RBMPPG based designs sufficiently make better the area and power consumption when the word length of each operand in the multiplier is at least 32 bits; these decreases over previous NB multiplier designs need in a small delay increase (approximately 5%). The power-delay product can be making smaller by up to 59% using the proposed RB multipliers when estimated with existing RB multipliers.

**TOOLS:**

1. **XilinxISE 14.7**

**LANGUAGE:**

1. **VerilogHDL**