1114-11-260   **Daniel A Goldston*** (`daniel.goldston@sjsu.edu`), Department of Mathematics and Statistics, San Jose, CA 95192-0103. *Sums and Differences of Pairs of Primes.* Preliminary report.

The Goldbach Conjecture states that every even number greater than 2 can be written as a sum of two primes. We can ask more generally how many such representations each even number has. While the Goldbach Conjecture remains unproved and inaccessible, we can examine the average situation by considering the sums of all pairs of primes in various ways. One application due to Montgomery and Vaughan in 1973 is a limitation on the accuracy of any asymptotic formula for the number of Goldbach representations.

The corresponding problem for differences between pairs of primes can be examined in a similar way. Hardy and Littlewood in 1922 conjectured an asymptotic formula for the number of pairs of primes both less than x that differ by a given number d. However the method used for sums of primes to obtain limitations in accuracy in this formula breaks down, and a satisfactory answer is not yet known.

Much work has been done on problems concerning the difference between consecutive primes, which is usually a more delicate situation than problems involving the difference between pairs of primes which may or may not be consecutive. We will discuss a problem where this is both true and false at the same time. (Received August 30, 2015)