1023-11-626   **Jordan O Tirrell*** (`tirrellj@lafayette.edu`), Easton, PA 18042, and **Clifford A Reiter** (`reiterc@lafayette.edu`), Lafayette College, Department of Mathematics, Easton, PA 18042.
Matrix Generation of the Diophantine Solutions to Sums of $3 \leq n \leq 9$ Squares that are Square.

Pythagorean Triples are well known examples of integer solutions to sums of two squares giving another square. It is well known that Pythagorean Triples may be generated parametrically. It is somewhat less well known that they may also be generated via matrices. In this note we describe how matrix generators may be used to produce all the Diophantine solutions of sums of squares when the number of squares in the sum is between 3 and 9. For $3 \leq n \leq 8$ all the Diophantine solutions may be obtained via matrix multiplication from a single type of initial solution. For $n = 9$ two different types of initial solutions are required. (Received September 19, 2006)