1086-00-1279 **Joseph M. DiMuro*** (joseph.dimuro@biola.edu). *On p-adic Sums of Games.* Preliminary report.

The theory of impartial games is well known. Given an impartial game G, we may associate to it its Grundy number $\mathcal{G}(G)$, the smallest ordinal which does not appear among the Grundy numbers of G's options. The impartial games which are losses for the next player to move are then exactly the impartial games with Grundy number 0. To find the Grundy number of a sum of multiple games (where a player's turn consists of a move in exactly one of the component games), one may write the Grundy numbers of each component game in base 2, and then add without carry.

Making use of a new mechanic called a "challenge", we will define the "p-adic" sum of impartial games for every prime p, where the Grundy numbers of each component game should be written in base p and summed without carry. We will then present the winning strategies for a variety of impartial games played under the p-adic sum. (Received September 20, 2012)