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**Title:** On some congruence conjectures modulo  $p^2$

**Author(s):** Guo-Shuai Mao

In this paper, we mainly obtain a congruence which contains a conjecture of Z.-W. Sun. For any prime  $p > 3$ , we have

$$\sum_{n=0}^{p-1} \left( \sum_{k=0}^n \binom{n}{k} \frac{\binom{2k}{k}}{2^k} \right) \sum_{k=0}^n \binom{n}{k} \frac{\binom{2k}{k}}{(-6)^k} \equiv \left( \frac{3}{p} \right) 3^{p-1} \pmod{p^2},$$

where  $\left( \frac{\cdot}{p} \right)$  stands for the Legendre symbol.

**Address:**

Guo-Shuai Mao

Department of Mathematics

Nanjing University of Information

Science and Technology

Nanjing 210044

P. R. China