Review Maohua Le paper,

When xy is even, the equation $y^x - x^y = z^2$, x, y, z positive integers, $\min\{x, y\} > 1$, $\gcd(x, y) = 1$, was shown by Luca and Mignotte [ref] to have only the solution $(x, y, z) = (2, 3, 1)$. The present paper shows there are no solutions when xy is odd. This result is achieved using only essentially elementary methods along with a straightforward application of the recent results of Bilu-Hanrot-Voutier [ref]; although it is not mentioned by the author, his methods are easily extended to handle the case xy even, which was handled by Luca and Mignotte by a more involved method, using a combination of lower bounds of linear forms in p-adic and Archimedian logarithms. (Luca and Mignotte similarly handle the equation $y^x + x^y = z^2$ when xy is even; Le's methods do not apply to this equation.)