Mochizuki 3-cocycle invariant of links in S^3 is one of Dijkgraaf-Witten invariant

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Abstract. Let p be an odd prime, and ϕ the Mochizuki 3-cocycle of the dihedral quandle of order p. Using ϕ, Carter-Kamada-Saito combinatorially defined a shadow cocycle invariant of links in S^3. Let M_L be the double covering branched along a link L. Our main result is that the cocycle invariant of L is equal to the Dijkgraaf-Witten invariant of M_L with respect to Z/pZ up to scalar multiples. We further compute Dijkgraaf-Witten invariants of some 3-manifolds. In this talk, we present a simple proof of the equality. This work is joint with Eri Hatakenaka.