On the behavior of the algebraic transfer

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Abstract: Let Tr_k: $F_{2\ GLk}$ PH_i(B double-struck V $sign_k$) → $Ext_A^{k,k+i}$y (double struck F $sign_2$, double struck F $sign_2$) be the alge-braic transfer, which is defined by W. Singer as an algebraic version of the geometrical transfer tr_k: π^{*S}((B double-struck V $sign_k$)+) → π^{*S} (S^0). It has been shown that the algebraic transfer is highly nontrivial and, more precisely, that Tr_k is an isomorphism for k = 1, 2, 3. However, Singer showed that Tr_5 is not an epimorphism. In this paper, we prove that Tr_4 does not detect the nonzero element gs $Ext_A^{4,\ 12.2^s}$ (double struck F $sign_2$, double struck F $sign_2$) for every s ≥ 1. As a consequence, the localized $(Sq^0)^{-1}Tr_4$ given by inverting the squaring operation Sq^0 is not an epimorphism. This gives a negative answer to a prediction by Minami.
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