Abstract for presentation at JDM 2026

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Title: On the 3-Pfister number in characteristic 2.

Abstract: Let F be a field of characteristic 2 and for $m \geq 1$, $I_q^m(F) := I(F)^{m-1} \otimes W_q(F)$, where $W_q(F)$ is the Witt group of non-degenerate quadratic forms over F and $I(F)$ is the fundamental ideal of the Witt ring $W(F)$ of nonsingular bilinear forms over F. We define the m-Pfister number of a quadratic form $\phi \in I_q^m(F)$, denoted by $\mathrm{Pf}_m(\phi)$, as the least number of forms similar to m-fold quadratic Pfister forms needed to express the Witt class of ϕ. We also define the universal invariant $\mathrm{Pf}_F(m,n)$, for any even integer n, as the supremum of $\mathrm{Pf}_m(\phi)$, where ϕ runs over n-dimensional quadratic forms in $I_q^m(K)$, and K varies over field extensions of F. My aim in the presentation is to prove an inductive formula that bounds $\mathrm{Pf}_F(3, n+2)$ using an upper bound of $\mathrm{Pf}_F(3,n)$. More precisely, I will show that if $\mathrm{Pf}_F(3,n)$ is finite, then $\mathrm{Pf}_F(3, n+2) \leq 152\mathrm{Pf}_F(3,n) + 3n - 6$ for any even integer $n \geq 0$.