Abstract:

Let k be any field.
In this talk we shall consider rings of the form
$A=k[X,Y,Z,T]/(X^mY-F(X,Z,T))$, $m > 1$, and present
several equivalent criteria for such a ring A to satisfy:

(i) $A[W] \cong k[X_1, X_2, X_3, X_4]$.

(ii) $A \cong k[X_1, X_2, X_3]$.

For instance, a necessary and sufficient condition for the above ring A
to be a polynomial ring is that $F(0, Z, T)$ is a variable in $k[Z, T]$.
Another equivalent condition is that A is a UFD, $\K_1(A)=k^*$ and a certain
invariant called ``Derksen invariant'' is trivial.
It follows from these criteria that when ch $k>0$, there exists
an infinite family of non-isomorphic rings which satisfy (i) but violates (ii);
in particular, {\it $\A^3_k$ is not cancellative when ch $k>0$}.

Note that the rings of the above type A include Asanuma's candidates for a
counter-example
to the Linearisation/Cancellation Conjecture
in positive characteristic as well as the Russell-Koras' threefold.