exception of groups of type triality D_4), of type G_2 or F_4, then conjecture 2 holds.
More recently, Colliot-Thélène and Scheiderer made the following "Hasse Principle Conjectures". One says that a field k has virtual cohomological dimension $\leq n$, written $\text{vcd}(k) \leq n$, if there exists a finite extension k'/k such that $\text{cd}(k') \leq n$. Let Ω be the set of all orderings of k. For $v \in \Omega$, let k_v be the real closure of k.
HP Conjecture 1: vcd $(k) \leq 1$, G connected, then the natural map $H^1(k, G) \to \Pi_{v\in\Omega} H^1(k_v, G)$ is injective.
HP Conjecture 2: $\text{vcd}(k) \leq 2$, G semisimple, simply connected, then $H^1(k, G) \to \Pi_{v\in\Omega} H^1(k_v, G)$ is injective.
HP Conjecture 1 was proved by Scheiderer in 1996 (after some partial results by Colliot-Thélène and Dueros). In the case of classical groups and groups of type G_2 and F_4, HP Conjecture 2 was proved by Parimala and E. B. The proof makes extensive use of the theorem of Merkurjev-Suslin.

M. ROST

On algebraic cobordism and the common slot lemma for algebras

An important consequence of the recent work of V. Voevodsky is the following:
Degree formula: Let X, Y be proper smooth varieties over a field k ($\text{Char}(k) \neq 0$) of dimension $d = p^n - 1$ (p a prime, $n \geq 1$). Then for any morphism $f : X \to Y$ one has

$$\left(\frac{S_d(X)}{p}\right) = (\deg f) \left(\frac{S_d(Y)}{p}\right) \mod I_Y.$$

Here $I_Y \subset \mathbb{Z}$ is the ideal generated by the degrees of the closed points on Y. The characteristic number $S_d(X) \in \mathbb{Z}$ is given by $S_d(X) = Q_d(c_1(TX), ..., c_n(TX))$ where Q_d is the d-th Newton polynomial. It is known (Milnor) that $S_d(X) \in p\mathbb{Z}$.
Corollary 1: $\frac{S_d}{p} \in \mathbb{Z}/I_X$ is a birational invariant of X.
Corollary 2: If $I_Y \subset p\mathbb{Z}$ and $S_d(X) \notin p^2\mathbb{Z}$, then $\deg f$ is prime to p.
We discussed an application of Corollary 2 to the common slot lemma for cyclic algebras of degree p.

A major problem is to compute the number $S_d(X)$ for certain X. Here one uses equivariant resolution of singularities and a theorem of Conner-Floyd on fixed point free $(\mathbb{Z}/p)^n$-actions.

J.-P. SERRE

On a formula of Kac and a theorem of Burnside

Let G be a semisimple algebraic group over a field k of characteristic 0. Assume G is of adjoint type. Let $g \in G$ be an element of G of finite order m, and $Z_G(g)$ its centralizer.
Theorem: One has $\dim Z_G(g) \geq l + 2\sum_{i=1}^{l} \left[\frac{d_i - 1}{m}\right]$, where $l = \text{rank}(G)$ and the