1) $J_\phi(z) = \mathbb{N}_1^p$;
2) $p \equiv 2(\mod 3)$, ω *or* $\omega^* = \frac{p+1}{3}\omega_1$, $J_\phi(z) = \mathbb{N}_3^{p-4} \cup \{1, p-1, p\}$;
3) ω *or* $\omega^* = a_k\omega_k + \ldots + a_l\omega_l$, $k \leqslant l < n-2$, $a_k a_l \neq 0$. a_l *or* $a_{l-1} + a_l = p-1$, $a_j + a_{j+1} + a_{j+2} \neq 0$ *for* $k < j < l$, a_k *or* $a_{k+1} + a_k = p-1$ *for* $k > 3$, $\mathbb{N}_1^p \setminus \{2, p-2\} \subset J_\phi(z)$;
4) ω *or* $\omega^* = a_1\omega_1$, $a_1 > \frac{p+1}{3}$, $\mathbb{N}_1^p \setminus \{2, p-2\} \subset J_\phi(z)$;
5) $p \equiv 1(\mod 3)$, ω *or* $\omega^* = \frac{p-4}{3}\omega_1 + \omega_j$, $1 < j < n$, $\mathbb{N}_1^p \setminus \{p-1\} \subset J_\phi(z)$.

This research was supported by the Belarus Basic Research Foundation in the framework of project F06-176.

ON $\mathbb{Q}$-CONIC BUNDLES

Yu. Prokhorov

Moscow State University, Moscow, Russia
prokhoro@mech.math.msu.su

The talk is based on joint works with Shigefumi Mori [1–3].

A $\mathbb{Q}$-conic bundle is a proper morphism from a threefold with only terminal singularities to a normal surface such that fibers are connected and the anti-canonical divisor is relatively ample. We study the structure of $\mathbb{Q}$-conic bundles near their singular fibers. The complete classification of $\mathbb{Q}$-conic bundles is obtained under the additional assumption that the base surface is singular. In particular, we show that the base surface of every Q-conic bundle has only Du Val singularities of type A (a positive solution of a conjecture by Iskovskikh). Under бertain additional assumptions we prove M. Reid's general elephant conjecture.

References

1. *Mori S., Prokhorov Y.* On $\mathbb{Q}$-conic bundles // Publ. RIMS. 2008. V. 44, P 315–369.
2. *Mori S., Prokhorov Y.* On $\mathbb{Q}$-conic bundles, II // arXiv:math. AC/0710.0792, Publ. RIMS (to appear).
3. *Mori S., Prokhorov Y.* On $\mathbb{Q}$-conic bundles, III // in preparation.

EXISTENCE AND CONJUGACY OF HALL SUBGROUPS IN FINITE GROUPS

D.O. Revin, E.P. Vdovin

Sobolev Institute of Mathematics SB RAS,
4 Acad. Koptyg av., 630090 Novosibirsk, Russia
{revin,vdovin}@math.nsc.ru

The term "group" always means a finite group. In what follows π is a set of primes, π' is its complement in the set of all primes, $\pi(n)$ is the set of all prime divisors of a rational integer n. A positive integer n is called a π-number if all its prime divisors are in π. For a group G we set $\pi(G)$ to be equal to $\pi(|G|)$. A subgroup H of G is called a π-Hall subgroup if $\pi(H) \subseteq \pi$ and $\pi(|G : H|) \subseteq \pi'$.

According to P. Hall, we say that G *satisfies* E_π (or briefly $G \in E_\pi$0, if G contains a π-Hall subgroup. If $G \in E_\pi$ and every two π-Hall subgroups are conjugate, we say that G *satisfies* C_π ($G \in C_\pi$0. If $G \in C_\pi$ and each π-subgroup of G is included in a π-Hall subgroup of G, we say that G *satisfies* D_π ($G \in D_\pi$0. Let A, B, H be subgroups of G such that $B \trianglelefteq A$ and