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**ACTIVITIES IN RUSSIA ON NEO DETECTION: ASTRONOMICAL
REQUIREMENTS, INSTRUMENTS AND PROGRAMS.**

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ABSTRACT

Russia continues to develop studies on NEO problem in various directions. We present here three issues of practical interest:

ASTRONOMICAL REQUIREMENTS:

In the last few years new insights in the NEO problem have appeared. The Chelyabinsk event has brought us to the understanding that meteoroids of decameter sizes are considerably dangerous and they should be included in the coming programs of massive detection of potentially hazardous bodies. This implies that class of PHO (in its classical definition as bodies larger than 140 m) should be considerably expanded. The task of massive detection of PHOs is to be considered as two tasks:

1. long range detection of relatively large bodies (> 50 m) which ensures warning time not less than some weeks (this makes possible organization of counteraction);
2. detection of decameter bodies in the near Earth space (this makes possible warning only).

Construction of national and international system(s) of detection of potentially hazardous objects (PHO) is considered as a practical task in many countries including Russia. This implies that all the requirements should be quite distinct. Basic input requirements are essentially astronomical ones by nature. Spatial distribution of PHOs is important to know if one intends to efficiently organize a survey for detection. The warning time and approach velocity of hazardous bodies limit the

required distance at which first detection must be done. From the other side the minimal size and albedo of the PHO are major limiting factors for detection hazardous body with given instrument at this distance. Orbital characteristics of the PHOs, number and distribution of observed positions of the objects (i.e. planning of astronomical observations) as well as an accuracy of astrometric observations strongly influence on the minimal length of orbital arc (and consequently on the time of quasi-continuous observation) required for the reliable classification of orbit the PHO. We reconsider here in a systemic way these and some other astronomical issues in order to understand requirements (practically important ones) for construction of the observational instruments and methods. These are different for tasks 1 and 2.

INSTRUMENTS:

Ground based instruments both working and under construction are briefly described. Though these ground based instruments devoted to detection and monitoring NEOs (moderate class dedicated telescopes of networks ISON and MASTER as well as larger telescope AZT-33VM) are rather numerous they are still not well integrated in the national network. Projects of space instruments (NEBOSVOD, EKOZONT and SODA) are under design.

PROGRAMS:

National campaigns and programs for detection and monitoring asteroids are briefly described.