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2023 Space Debris Activities and Status in Republic of Korea

Eun Jung Choi
Center for Space Situational Awareness
Korea Astronomy and Space Science Institute
Growth of Space Objects

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>ON ORBIT</th>
<th>TRACKABLE</th>
<th>DECAYED</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYLOADS</td>
<td>ACTIVE</td>
<td>INACTIVE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9,435</td>
<td>2,926</td>
<td></td>
<td>17,318</td>
</tr>
<tr>
<td>DEBRIS</td>
<td>15,887</td>
<td></td>
<td></td>
<td>41,530</td>
</tr>
</tbody>
</table>

| TOTAL | 58,848 | 28,248 | 25,157 | 30,600 |

Last Updated: 2024-01-26 06:17:40
Re-entry Situation

The Korean Peninsula was included in the predicted range of ERBS satellite reentry. The Ministry of Science and ICT warned of falling satellite debris on peninsula.

> Space Risk Alert issued and Safety Information text sented.

Ministry of Science and ICT] There is a possibility that some debris from an ERBS satellite may crash near the Korean Peninsula between 12:20 and 13:20.

Please be careful when going out during these times.
Space Object Re-entry Risk Monitoring

<table>
<thead>
<tr>
<th>Time</th>
<th>KASI</th>
<th>CSPOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-3h</td>
<td>2023-01-09 12:49:01±30min</td>
<td>2023-01-09 13:06:00±33min</td>
</tr>
<tr>
<td>D-6h</td>
<td>2023-01-09 12:53:53±30min</td>
<td>2023-01-09 13:01:00±1h</td>
</tr>
<tr>
<td>D-9h</td>
<td>2023-01-09 12:53:53±30min</td>
<td>2023-01-09 13:27:00±2h</td>
</tr>
</tbody>
</table>
Space Object Re-entry Observation

Monitored by Korea Meteorite Network (‘23.1.9. 13:14)

Video captured by cell phone camera (‘23.1.9. 13:10~13:13)

Analysis Result of ERBS Reentry Trajectory
1st Preparedness Plan for Space Risk (‘14~’23)

**SYSTEM**
Building a quick response system against disasters resulting from space hazards

**TECHNOLOGY**
Developing technologies and constructing facilities for monitoring space hazards

**INFRASTRUCTURE**
Creating an environment for expanding capability of the response system (International cooperation, R/D, etc)
OWL-Net (optical Wide-field patrol Network)

Space Objects Tracking and Monitoring Network

5 Global Optical Space Surveillance Network composed of five robotic observatories

- Track and Monitor LEO satellites and space debris and GEO belt
- Observe for asteroids and comets
Observation of meteors falling down over the Korean peninsula
Detection of fireballs and generation of information for the estimation of their falling trajectories and impact areas

16 monitoring stations was installed over the southern part of the Korean peninsula in 2023.

- Publicity at the national level that also contributes to science gifted education
- Plan to join the international meteor observation network
KASIOPEIA is a comprehensive space situational awareness total solution for integration all phases from observation data preprocessing to predictive risk assessment.
SSA System Development

SSA System R&D Project (‘23~’27)

Data Sharing & International Cooperation

KOREA SSA DATA CENTER

- Measurement DB
- Orbit Data DB
- Analysis Data DB

SPACE SAFETY

SPACE SECURITY

SPACE SUSTAINABILITY

Sensor | Satellite Operator | UN | Government | Civil
KEPLER
(Korea Enhanced Platform for Lowering Space Risk)

Collection
Observation System

Management
Integrated Management System (IMS)
- Data preprocessing
- Observation Data Interface
- Data Management (International Cooperation + Catalogue + Observation Data)
- Observation Infra
- Mission control
- Mission Planning
- Infra Status Display

Validation
Integrated Analysis System (IAS)
- Data Postprocessing
- Space Objects Identification
- Space Objects Orbit Determination
- Reentry Prediction
- Collision Prediction
- Risk Assessment

Provision
Users
- Government
- Satellite Operator
- Civil Company
- Public
2nd Preparedness Plan for Space Risk (‘24~’33) (in preparing)

**SYSTEM**
- Strengthening the national space risk response system
  - SSA/STM System and Leading discussion on International Cooperation
  - Expansion of SSA area

**TECHNOLOGY**
- SSA System
  - Optical, Radar, Laser System + Integrated Analysis System
  - OWL-Net Operation and Upgrade
  - SLR Operation and Upgrade
  - New Radar System Development
  - KEPLER System Development

**SPACE INDUSTRY & CAPACITY BUILDING**
- Creating SSA/STM Industry Capacity Building
  - SSA/STM Industry Promotion
  - Civil-Military Cooperation
  - International Contribution
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THANK YOU

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