# Agni V and China/India Ballistic Missile Defense

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# Agni-V missile

- Why did India develop Agni- V missile?
  - Agni-V is the first India ICBM.
  - Agni-V is not aim at China.
  - Big country dream/ South Asia hegemony
- Does Agni V have Multiple Independently Reentry Vehicles (MIRV) capability?
- What will India do next?

# Is Agni-V the first India ICBM?

# Polar Satellite Launch Vehicle (PSLV) is the first De facto India ICBM.

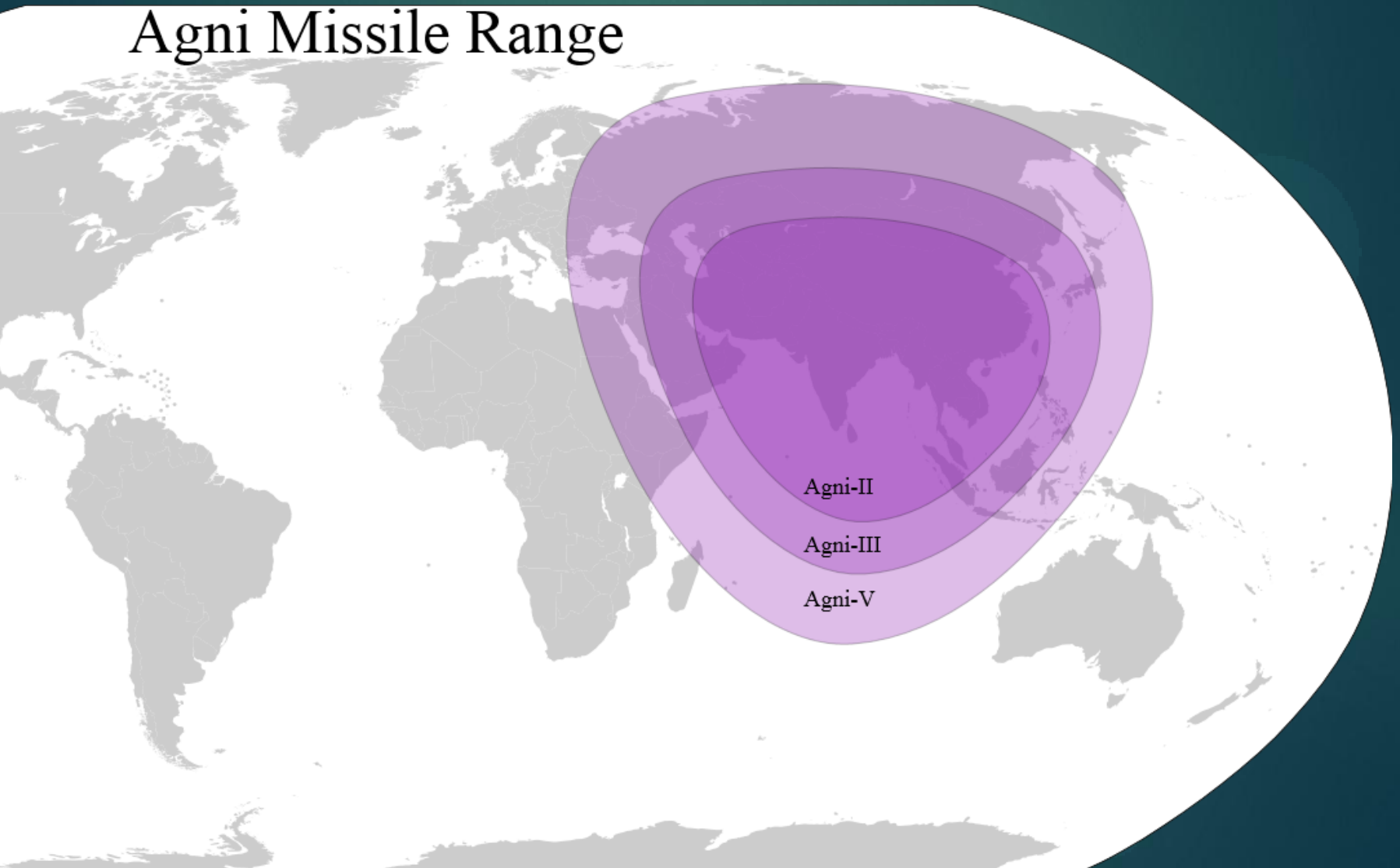
## Comparison between Russia China First generation ICBMs with PSLV

| | Russia SS-6 | CHN DF-4 （LM 2) | IND PSLV |
|---|---|---|---|
| Mass | 276 ton | 183 ton | 294 ton |
| Payload | 3.7 ton | 3 ton | 3 ton (5 ton) |
| Range | 12,000 km | 12,000 km | LEO |
| In Service | 1957 | 1981 | 1993 |

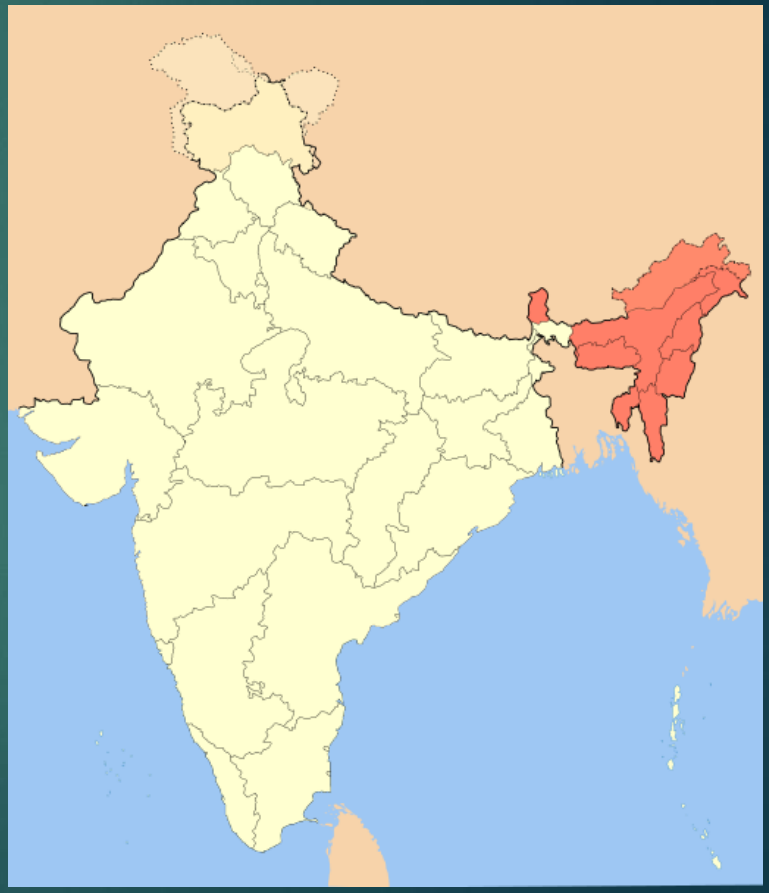
# What is Agni V?

- It is the 3rd Generation ICBM
- It is a Solid Fuel, Road Mobile Missile.
- It provides reliable "second strike" capability

# Is it aim at China?

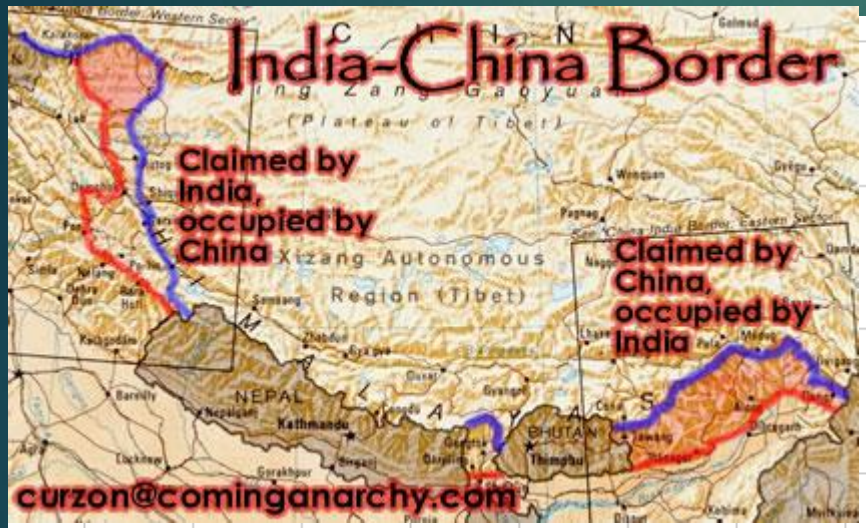


# Agni III is launched in the North-East India.

# What is 5,000 km range means?

# Why did India develop Agni V?




**GDP**




- Nuclear Weapons to offset Conventional Weapons

# Why Chinese Media did not say so?

- **“China is a threat” is political incorrect in China.**
- **In many Chinese subconscious, China is not a superpower / great power.**

# MIRV?

Agni-III

Warhead

Third Stage

Second Stage

First Stage

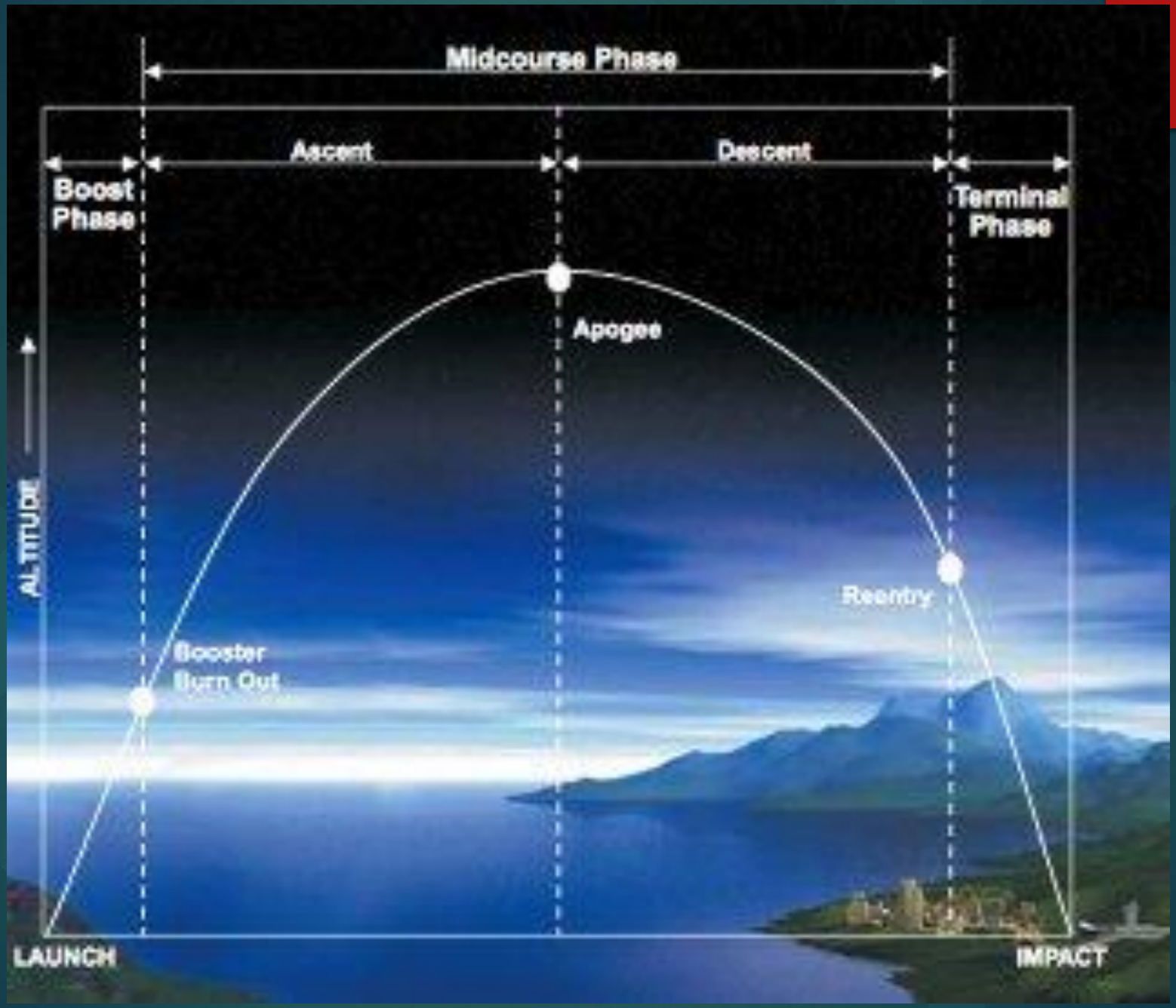
Agni-V

- India missiles still have a lot to improve.
  - Reliability
  - Mass
  - MIRVs
- Agni V does provide strategic nuclear deterrence against China.
- Nuclear Dialogue between China and India should be encouraged.

# Missile Defense

# Chinese Missile Defense

- **China performed a mid-course missile defense in 2010.**
- **Missile Defense Test or ASAT Test?**
- **From technique viewpoint, Chinese Missile defense is unable to defend against US Missiles, but might be able to defend against India Missiles.**


Midcourse Phase
Ascent
Descent
Boost Phase
Terminal Phase
Apogee
ALTITUDE
Reentry
Booster Burn Out
LAUNCH
IMPACT


Data SIO, NOAA, U.S. Navy, NGA, GEBCO
US Dept of State Geographer
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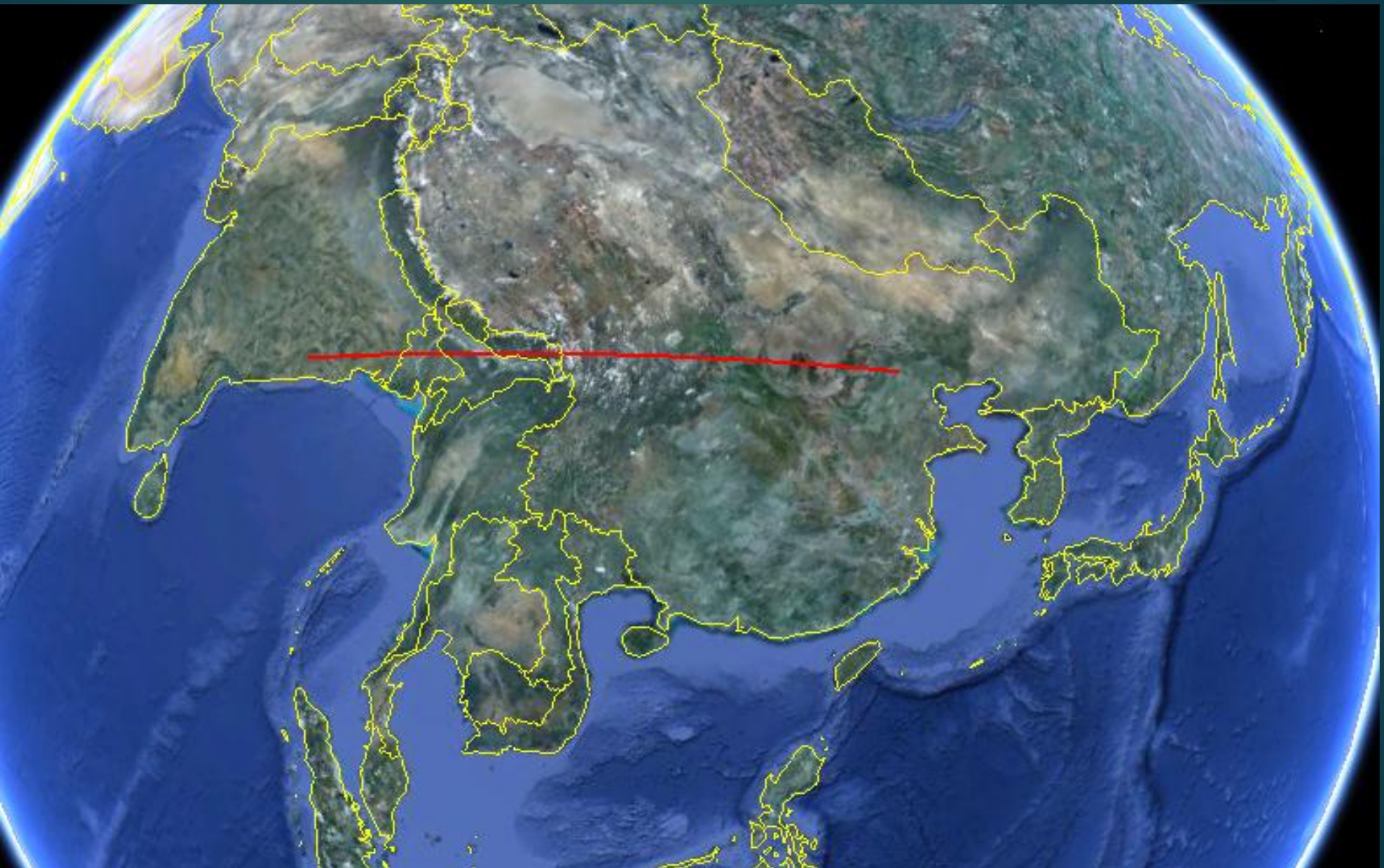

# India Ballistic Missile Defense

- It was firstly designed to intercept Pakistan ballistic missiles.

- However, on 6 May 2012, Dr. V. K. Saraswat, the Director General of the Defense Research and Development Organization, said "Phase-II (of the missile defense) would be completed by 2016 to protect against missiles having range up to 5,000 km."

Could the planned India missile defense really be able to defend against Chinese missiles?

# Current India Missile Defense

- **Swordfish RADAR ----Long Range Tracking Radar**
- The **Prithvi Air Defence (PAD)**
  - exo-atmospheric
  - altitude of 80 km
- **Advanced Air Defence (AAD)**
  - endo-atmosphere
  - altitude of 30 km
- **Terminal phase Missile Defense**

The DRDO plans to upgrade the capacity of Swordfish Radar to 1,500 km by 2011.

Developing AD-1 and AD-2 -- high speed interceptors.

# Swordfish Radar

- **The Swordfish Radar, derived from the Israel GreenPine Radar, is a L band Radar.**
  - **L band Radar is not a imaging radar.**
  - **It is unable to discriminate decoys.**

# Terminal phase missile Defense

- **Can only protect several key locations.**
- **Decoys problem**
- **It is difficult to intercept ICBM warhead**
- **China may have maneuverable warhead**

- Does China really want to develop Missile Defense?
- Does India really need to develop Missile Defense against China?
- More Dialog is needed.