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JUGNU (ISRO Satellite) for Carbon Check

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Abstract ***In this age of Globalization ,pollution is one of major concern of every country and every Country is training to minimize on its level , in this direction USA space agency NASA has launched an satellite OCO_2 which will sense and monitor the content of carbon diode and other leading human greenhouse gases responsible for warming our globe . In this way India nana satellite JUGNU devolved by IITK can also be used for monitoring the carbon content emitted by various states in our country and accordingly policies can be made .***

Key Words ***JUGNU, ISRO, NASA ,CARBON DIOXIDE***

I. INTRODUCTION

JUGNU is the nano satellite developed by IITK(Indian Institutes of technology-Kanpur) with ISRO this a smallest satellite that constitutes of all basic blocks of satellite, with weighing 3kg and having Dimensions of 10 cm x 10 cm x 32 cm . This was launched by ISRO in

ISRO's PSLV C-18 on 12th Oct 2011 .Our country is among the most polluted countries of Asia so we can make use of this satellite for pollution check or emission of carbon dioxide by various states and then accordingly policy can be made by various state governments for controlling pollution in their states.

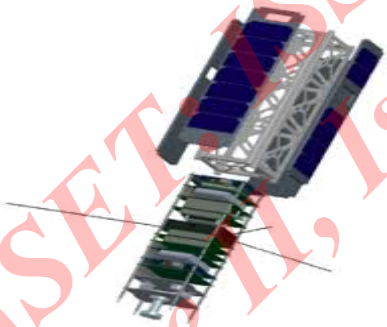


Fig 1
JUGNU Satellite

II. CO_2 EMISSION OF INDIA

India is the third largest emitter of CO_2 after china and united sates . With 17 percent of world population, India contributed some 5 percent of human-sourced carbon dioxide emission; compared to China's 24 percent share. About 65% of emission of carbon Dioxide is from domestic use and power sector and about 9% of CO_2 from transportation and remaining comes from natural gas fire ,natural oil fir etc . The most significant greenhouse gases emitted consist of Black carbon, NO_x, methane and other pollutant .Out of all these CO_2 is most abundant in composition so by keeping continues trace on CO_2 we can control this greenhouse gas

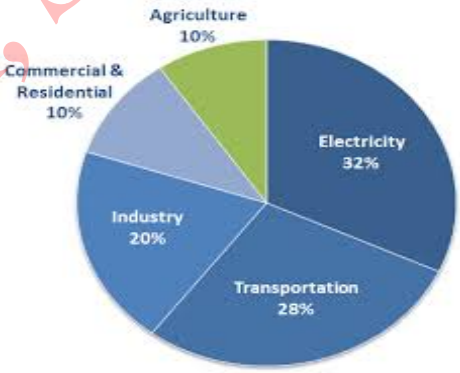


Fig 2
Contribution of CO_2 by various Sectors

III. OTHER COUNTRIES IN THIS DIRECTION

USA space agency has recently launched an satellite Orbiting Carbon Observatory-2 (OCO-2) which will sense and monitor the carbon emission by various countries across the globe for over next two years and then NASA is planning to use this data for welfare of society .This mission will also locate the natural resources of CO_2 and there natural sink . The Scientists currently don't know exactly where and how Earth's

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oceans and plants have absorbed more than half the carbon dioxide that human activities have emitted into our atmosphere since the beginning of the industrial era. So for the betterment of the society we need to keep consistent watch on the emission sources and sinks of CO_2.

IV. JUGNU SPECIFICATIONs

JUGNU satellite is in Equatorial orbit 860 km of height ,its base control station is situated at IIT Kanpur and its mass is 3Kg and structure 10 cm x 10 cm x 32 cm . Its Imaging is of Near IR range(700-850 nm), GSD - 197 m, Focal length-35mm, F no.-4 and Position accuracy~20 m, 12 ch, Patch antenna For data storage it has Triple modular redundancy memory, SD card 2 GB. Jugnu set up communication by using Data Downlink: 437.505 MHz, FSK, 2400 bps Data Uplink: 145.980 MHz, FSK, 600 bps Beacon Downlink: 437.275 MHZ, OOK, and Ground Station Yagi-Uda(Uplink), Yagi-Uda (Downlink), GUI interface in Lab VIEW, rotary system.

V. ADVNTAGES

- We can keep Regular check on the carbon emission by various sectors and than accordingly we can frame our policies of pollution measurement.
- Once we are able to control the carbon emission we can easily control Global warming
- We can make business out of this project by giving services to other countries

VI. DISADVANTAGES

- As we add new modules to this satellite leads to increase in its mass and leads to increase in its launching cost
- With increase in one more block of satellite the complexity of this would get increased

VII. FUTURE SCOPE

If we are able to launch this satellite successfully than in future we can also add more modules on it for keeping measure of Green House gasses like NO_x Methane etc and then we can also place thermal sensors for measuring of temperature of different states

VIII. CONCLUSION

By making JUGNU able to measure and keeping track of carbon dioxide we can control the emission of different states.

IX. References

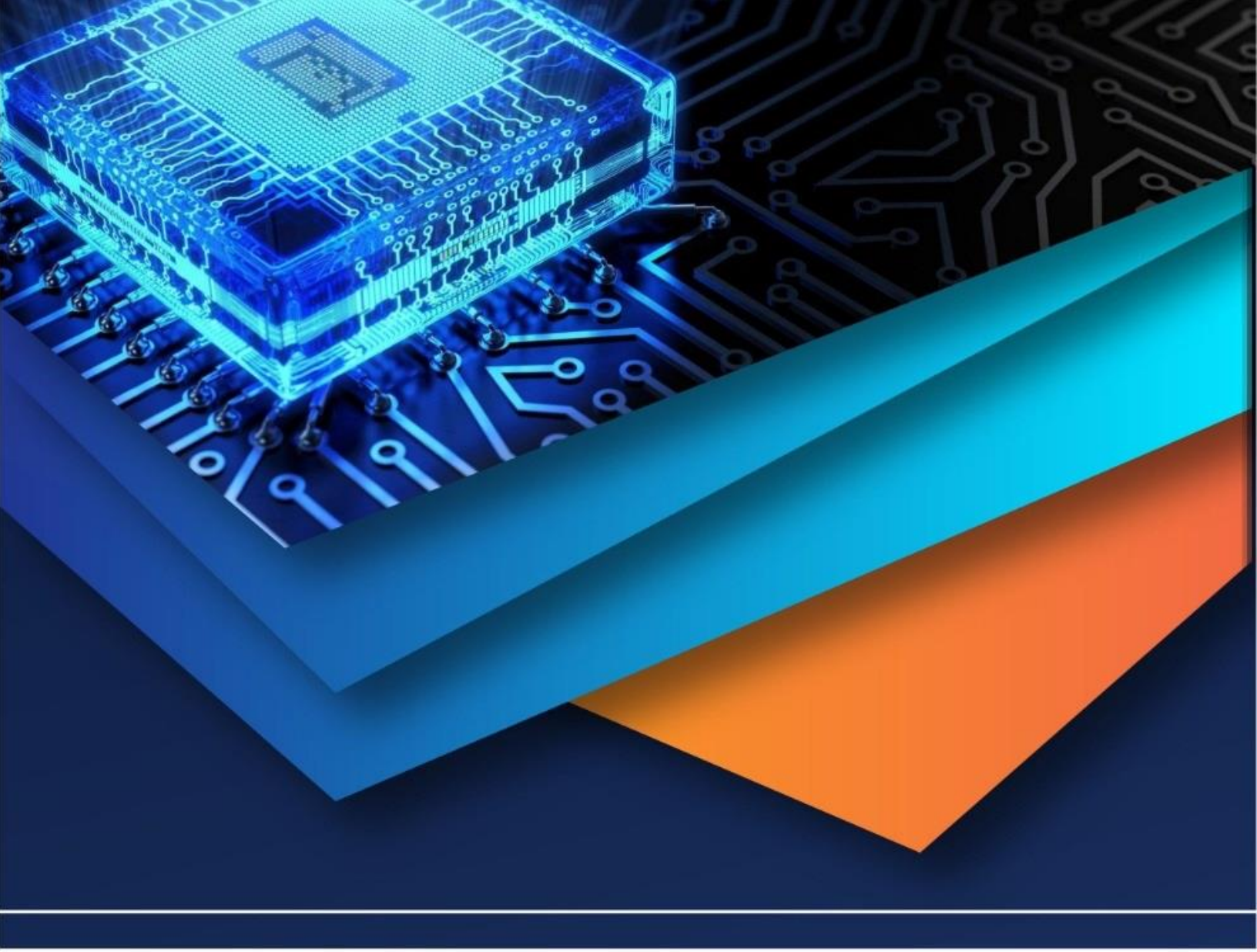
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