

Issue 102  
January 2022

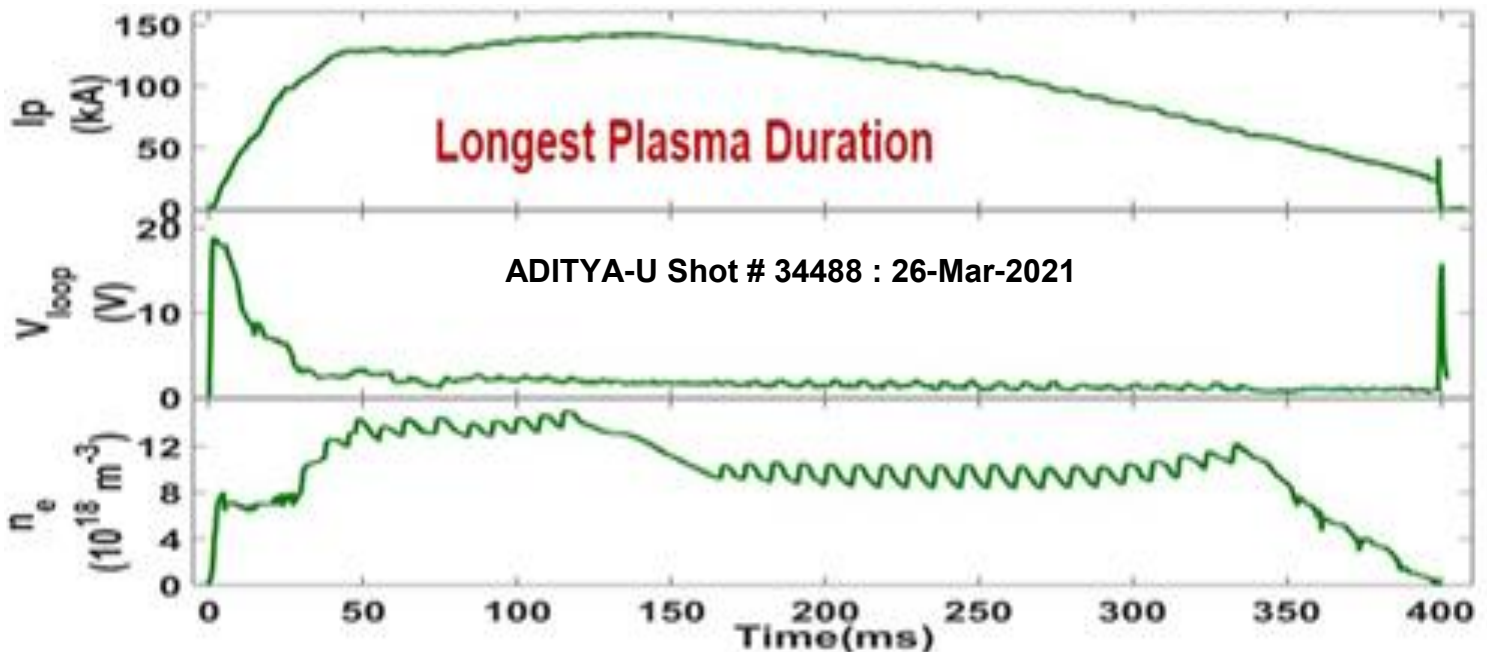
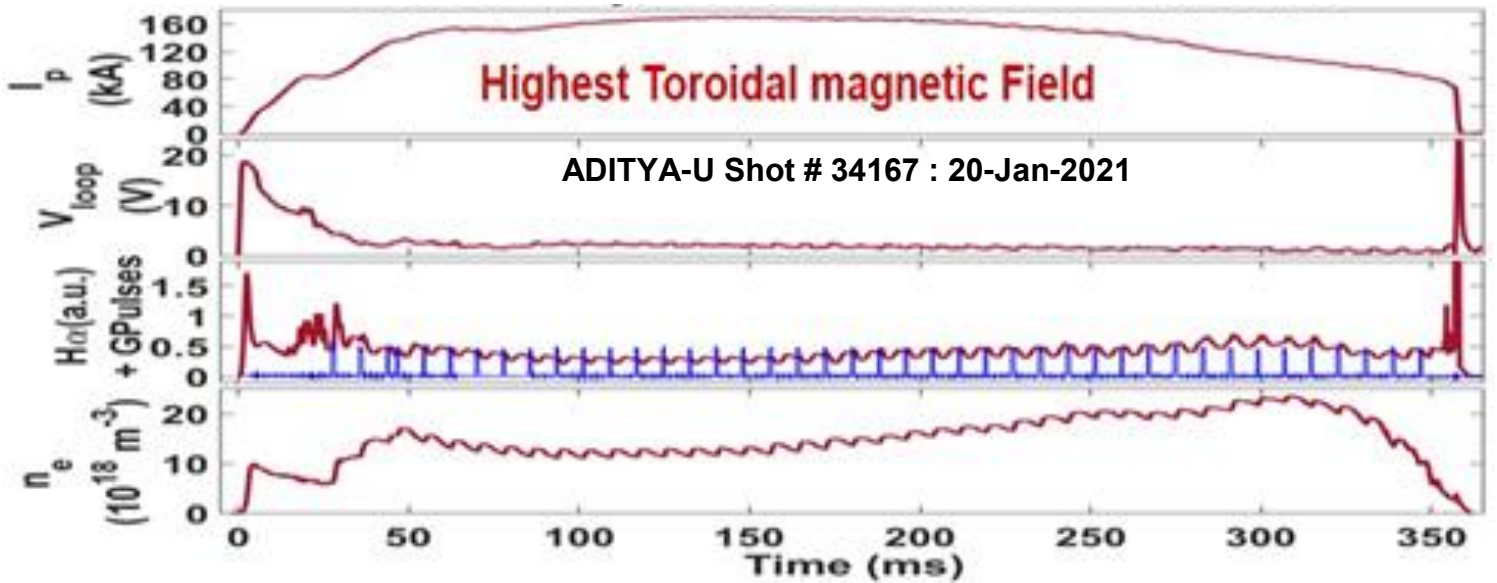
# The Fourth State

Newsletter of the Institute For Plasma Research, Gandhinagar, Gujarat (India)



## Activities of ADITYA-U Operations Division

The first Indian tokamak, ADITYA, an ohmically heated, air-core tokamak operated during the period from September 1989 to February 2015 with a circular poloidal limiter, has been upgraded to a tokamak named ADITYA Upgrade (ADITYA-U) to attain shaped-plasma operations with an open divertor without any baffle in single and double-null configurations. The disassembly of ADITYA tokamak and re-assembly of ADITYA-U took almost a year, followed by its commissioning and later the First Plasmas in ADITYA-U was established in December-2016 with the inclusion of new graphite toroidal belt limiter as the primary plasma-facing components. Last five years (January 2017 - December 2021), ADITYA-U operations have been mainly focused on realizing the plasma parameters close to the design parameters of circular plasmas in limiter configuration and also the initiation of shaped plasma operation. The maximum plasma parameters achieved in ohmically heated ADITYA-U limiter (toroidal belt-limiter) plasmas are:  $I_p \sim 210$  kA, discharge duration (t)  $\sim 400$  ms, chord averaged electron density ( $n_e$ )  $\sim 6 \times 10^{19} \text{ m}^{-3}$ , central electron temperature ( $T_{e0}$ )  $\sim 500$  eV and stored energy (W)  $\sim 3$  kJ. The machine is operated at a maximum toroidal magnetic field of ( $B_\phi$ )  $\sim 1.5$  T (100% of the design parameter) and edge safety factor ( $q_a$ )  $\sim 3 - 4.5$ .



The 36th National Symposium on Plasma Science & Technology (Plasma-2021) was organized by PSSI and BIT Mesra, Jaipur Campus during 13-15 December, 2021. This conference was conducted completely as an online event.

	Participants	Posters	Oral	Invited
IPR	124	92	07	02
CPP-IPR	04	04	-	-
ITER-India	15	14	-	01

The conference was inaugurated at BIT Mesra Jaipur campus and Prof. Prabhat Ranjan, Vice Chancellor, DYPIU, Pune delivered the Keynote Address. Dr. Shashank Chaturvedi, Director, IPR also addressed the participants. Dr. Devendra Sharma and Dr. Jinto Thomas of IPR and Shri Arun Chakraborty of ITER-India delivered invited talks in Basic plasma, Plasma Diagnostics and Fusion Technology sessions respectively.



Top : Releasing the conference Abstract Book. Bottom (L) Dr Shashank Chaturvedi, Director, IPR (M) Prof. Indranil Manna, VC, BIT Mesra and (R) Shri V. K. Sharma, Director, MSME Development Institute, Jaipur addressing the online gathering during the inauguration of the conference.

Award	Name of the Recipient	Title of Abstract
Jaidutt Saraswati Sodha PSSI Plasma Award	Shantanu Karkari, IPR	For his significant research contributions through publications in reputed journals in plasma physics.
Buti Young Scientist Award	Hariprasad M. G., IPR	"First Order Phase Transition and Crystal-Fluid Coexistence in a Complex Plasma System"
Oral Presentation Award	Shishir Purohit, IPR	"Aditya tokamak plasma disruption characterization"
Poster Presentation Award	Tanmay Macwan, IPR	"Novel Explanation of the Cold Pulse Propagation Phenomenon Induced by Gas Puff in ADITYA-U Tokamak"
Poster Presentation Award	Mizanur Rahman, CPP	"Bulk Rate Synthesis Of Metal-Oxide Nanomaterials For Treatment Of Wastewater And Other Biomedical Applications"
Poster Presentation Award	P. N. Maya, IPR	"Overview of the Recent Investigations on the Surrogate-Particle-Irradiation in Tungsten Plasma-Facing-Materials"