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VASIMR® VX-200 MEETS FULL POWER EFFICIENCY MILESTONE.

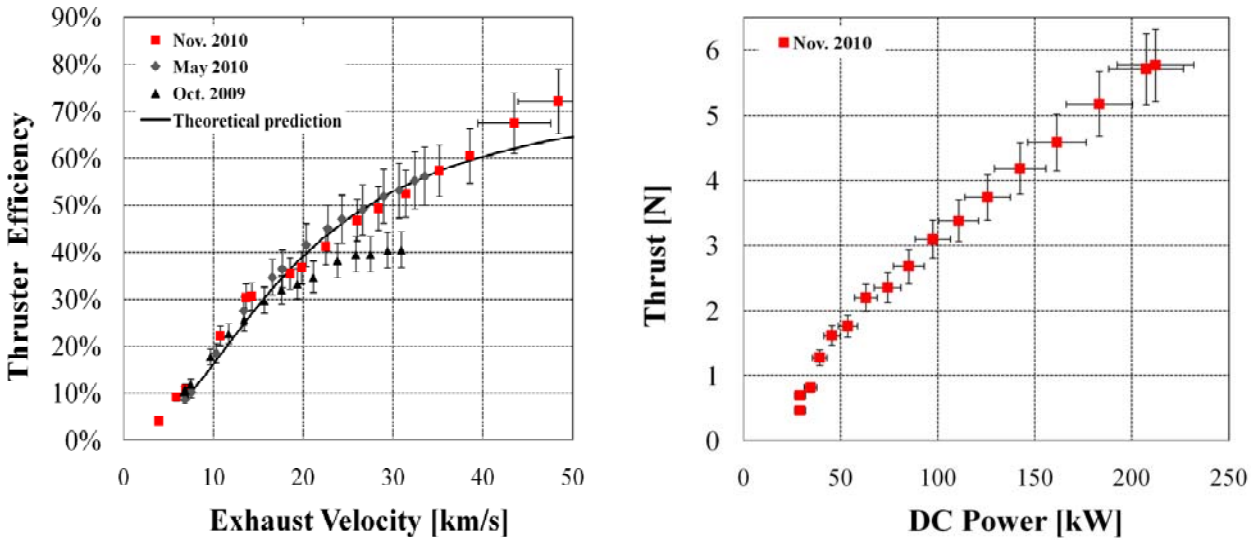
[Houston, TX For immediate release] – Ad Astra Rocket Company's VASIMR® VX-200 rocket prototype demonstrated its highest power efficiency and performance so far in tests, which ended Friday November 19 at the company's Houston laboratory. Last week's results met the efficiency milestone set by the company as it specifies the requirements for the VF-200 flight engine for the International Space Station. The VX-200 is the full power laboratory prototype that provides the technical basis for the design of the flight hardware.

Last week's results are a new performance record for VX-200 and confirm an experimental trend observed earlier this month, as the research team continued to explore the high power performance envelope of the engine. Refinements to the second stage RF coupler and impedance matching circuits introduced early this fall, as well as modifications to some of the start-up and propellant control set-points, contributed to these results. These modifications reduced the coupler's operating voltage and hence its susceptibility to electrical breakdown but preserved the intrinsic RF coupling efficiency of the system.

The thrust data represents a new company record and already exceeds the requirement specified for the VF-200 flight engine core by a factor of two. These data appear to follow a linear upward trend with input DC power with no evidence of saturation. The new record performance numbers for VASIMR® operating with Argon propellant are listed below:

VX-200			
Power (kW)	**Thrust (N)**	**Exhaust speed (km/s)**	**η**
200	**5.7**	**50**	**72%**

The experimental efforts at both Ad Astra facilities



Thruster efficiency vs exhaust velocity (specific impulse x 10) and thrust vs input DC power. Results are shown for three separate experimental campaigns in October 2009, May of 2010 and November of 2010. Hardware refinements to the second stage have led to significant performance improvement.

cap a yearlong campaign to experimentally validate the performance envelope of the VX-200 and demonstrate its efficient high power operation. "The team's accomplishment was impressive, as several control parameters intended for the final design are not yet available in VX-200. Nonetheless, through clever operational modifications, based on subtle observations, the team accomplished the result. It required great attention to detail, rigorous scientific technique, and more than anything else, perseverance. We can now exploit this new knowledge in the final design. It was great work by the team!" said Dr. Mark Carter, Ad Astra's head of technology and principal designer of the second stage RF coupler.

"Many of the flight applications at the heart of our business model – orbital debris removal, satellite servicing, cargo flights to the Moon and Mars, and ejecting fast probes to the outer solar system – have required that the propulsion system achieve 60% *system* efficiency at 50 km/s exhaust velocity. The DC electrical power coming from a solar or nuclear power source has to be converted to radiofrequency (RF) power, which is then absorbed by the plasma. The fraction of the RF power that is converted to thrust is called the "thruster efficiency". Now we have demonstrated in the lab the 70% *thruster* efficiency we need to achieve the 60% end-to-end system efficiency, at the required exhaust speed. Our technology is more mature and our company's plans are on a firmer foundation." said Dr. Tim Glover, Senior Vice President for Development.

Demonstration of good VX-200 efficiency at high power was one of the key company objectives for 2010, as the team advances to the VF-200 preliminary design review (PDR) milestone with NASA a year from now. The VF-200 is the first engine that Ad Astra plans to fly in space and is presently working with NASA under a 2008 Space Act Agreement with the space agency to interface the rocket engine on an exterior portion of the International Space Station in late 2014. NASA and Ad Astra are presently engaged in integration activities to facilitate this mission. "I am thrilled with the recent achievement. It is a solid validation of the VASIMR® system performance at full throttle" said Dr. Jared P. Squire, Senior Vice President for Research and overall leader of the experimental program. "This is a very fitting closure as we approach the end of another successful year for Ad Astra. The teams have worked tirelessly and efficiently at both facilities. I congratulate them on this achievement" said Dr. Franklin Chang Díaz, Ad Astra's President and CEO.

Short for Variable Specific Impulse Magnetoplasma Rocket, VASIMR® is a high-power plasma-based space propulsion technology being developed by Ad Astra that could provide far more efficient in-space transport than today's chemical rockets. The company envisions an initial space test of the technology in late 2014, followed by commercial deployment shortly thereafter to greatly reduce the operational costs of maintaining an evolving space infrastructure, including space stations, satellites, lunar outposts and fuel depots in the Earth-Moon environment. Ultimately, VASIMR® engines could also greatly shorten robotic and human transit times for missions to Mars and beyond.

THE TECHNOLOGY

VASIMR® works with plasma, a very hot gas, at temperatures close to the interior of the Sun. Plasmas are electrically charged fluids that can be heated to extreme temperatures by radio waves and controlled and guided by strong magnetic fields. The magnetic field also insulates any nearby structure, so temperatures well beyond the melting point of materials can be achieved and the resulting plasma can be harnessed to produce propulsion. In rocket propulsion, the higher the temperature of the exhaust gases, the higher their velocity and hence the higher their fuel efficiency. Plasma rockets feature exhaust velocities far above those achievable by their chemical cousins, so their fuel consumption is extremely low.

ABOUT AD ASTRA

Ad Astra Rocket Company was established in early 2005 to commercialize the technology of the VASIMR® engine, an advanced plasma propulsion system with potential to support an emerging in-space transportation market. The company has its main laboratory and corporate headquarters at 141 W. Bay Area Boulevard in Webster, Texas, USA, about two miles from the NASA Johnson Space Center. Ad Astra also owns and operates Ad Astra Rocket Company, Costa Rica, a supporting research and development subsidiary in Guanacaste, Costa Rica.