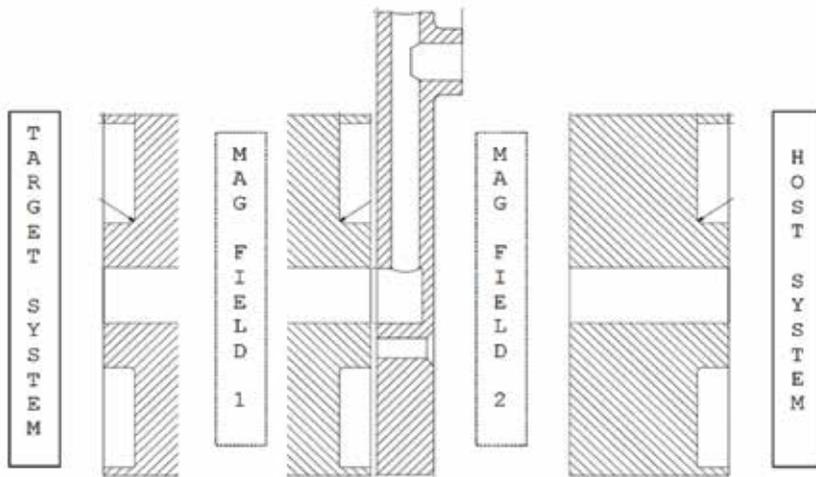




# NAVAL RESEARCH LABORATORY

The Corporate Laboratory for the Navy and Marine Corps

## Magnetically Attracted Fluid Transfer System



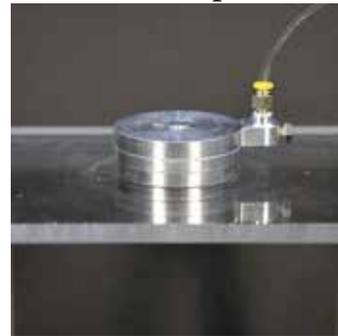
**Schematic of full system in operation**



**Top cap with transfer puck attached**



**Full system connected on platform**



**Fluid transfer puck connected without top cap**



**Demonstration of system**

The Naval Research Laboratory (NRL) in partnership with the Defense Advanced Research Projects Agency (DARPA) have developed a new system where a refueling vehicle can be operated autonomously or remotely to fuel a vehicle with a magnetically coupled rapid-breakaway fuel transfer system. The system provides a self-aligning magnetic connection between the host system and a target system. The magnetic connection includes a transferrable puck that the host system manually or autonomously attaches to a target vehicle's fuel receptacle. Enhancing the system with a controllable electromagnet, it can directly control when the puck is transferred or if a connection should be maintained during refueling. The magnetic connection differential allows the puck to connect to the target system, and in the case of a jolt to the system, the magnetic connection will be lost to the host system while the puck remains connected with the target.

### Advantages

Transfers fluids or non-fluids, Reduces or eliminates human intervention, Automatically self-aligning, Scalable to larger fluid transfer rates

### Potential Applications

Transfer of non-fluid: gas, power, data; Unmanned Systems: aerial, ground, water, and underwater vehicles

### Licensing or Collaboration Opportunity

US Patent application is available for commercial license to companies with commercial interest. Collaborative research and development is available under a Cooperative Research and Development Agreement (CRADA).

### References

US Patent Application No. 14/028077 entitled "Magnetically attracted fluid transfer system" filed on 9/16/2013 on behalf of Gregory P. Scott and Carl G. Henshaw