

**ISL's research on systems with controlled effects for non-lethal applications**  
(proposed as poster)

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At the French-German Research Institute of Saint-Louis (ISL), several research topics are grouped in a project called "systems with controlled effects for non-lethal applications".

One topic deals with a vortex ring generator. This device is planned for the aerodynamic delivery of irritating or marking particles to a target. Because no projectile is used, any mechanical hurting of the target can be excluded. Details about this research topic are given in another paper proposed for the symposium.

The second topic is an acoustic generator with a directed sound emission. Such a device can transmit selective information to individuals in a group so that these can be controlled from outside. Another possible application could be the directed emission of loud noise, which can lead to nausea effects. A prototype of such a generator was tested at ISL and its directivity could be confirmed. The measurements have shown that for real applications the sound level has to be increased further. Therefore, improved piezoelectric materials for the sound generator are currently tested and specified.

An additional topic is related to a projectile launching device. A theoretical study was started to design a distance-limited launcher, which is pneumatically driven. It is planned to complete the theoretical study with the realization of a prototype launcher and with some experiments. The results could be used for the validation of theoretical models related to external and terminal ballistics for non-lethal applications.