

# Feasible optical weak measurements of complementary observables via a single Hamiltonian

Fri, 2012-03-30 16:00 - [Q-Essence Coordinator](#) [1] **Date:** 2012-02-23

**Author(s):**

Shengjun Wu, Marek Zukowski

**Reference:**

Phys. Rev. Lett. 108, 080403 (2012)

**URL:**

<http://prl.aps.org/abstract/PRL/v108/i8/e080403> [2]

We show that the process of three-wave mixing in a non-linear crystal (such as employed in down conversion processes) can be used for versatile weak measurements. That is the crystal field interaction Hamiltonian enables weak measurements of pairs of complementary variables. To obtain the weak value of variable  $A$  one has to perform weak measurements twice. This seems to be a drawback, but as a compensation we get for free the weak value of a complementary variable  $B$ . What is even more interesting one can tune the scheme such that one has access to a continuous set of possible weak measurements, without any need to employ a new Hamiltonian. Thus we have a ready implementation of tunable weak measurements.

- [QIPC](#) [3]
- [Q-ESSENCE](#) [4]
- [Highlight](#) [5]
- [Result](#) [6]

**Source URL:**

<http://qurope.eu/db/publications/feasible-optical-weak-measurements-complementary-observables-single-hamiltonian>

**Links:**

[1] <http://qurope.eu/users/qessence>

[2] <http://prl.aps.org/abstract/PRL/v108/i8/e080403>

[3] <http://qurope.eu/category/qipc/qipc>

[4] <http://qurope.eu/category/projects/ips/q-essence>

[5] <http://qurope.eu/category/attribute/highlight>

[6] <http://qurope.eu/category/attribute/result>