I. Towards a source of heralded single photons

IDEA: trigger detection “heralds” existence of signal sibling photon.

Phase matching condition:

\[
\frac{R_s}{R_p} = \eta_2 \text{ losses limit the doubles to singles ratio.}
\]

II. Generation of polarization Bell states using a KTP QPM waveguide

Type II operation reduces losses due to the straightforward separation of photon pairs.

III. Long wavelength Hong-Ou-Mandel interferometry

Why are positively correlated pairs exciting?


Unwanted distinguishing Information eliminated in multi-source expts.


Spectral uncorrelation

Positive correlation

System immune to dispersion

100% HOMI visibility

Why are QPM waveguides sexy?

• Nonlinear waveguides produce downconversion in controlled spatial modes, drastically improving collection efficiencies.

• Diagonal and non-diagonal elements of the tensor may be accessed. Higher count rates are possible.

• Additional degrees of freedom (e.g. variations in QPM period) allow the two-photon state to be engineered to particular needs.

U'Ren et al, OSA annual 2000, talk ME2