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Correction of walk-off induced wavefront distortion for continuous-variable applications HONGXIN ZOU, YONG SHEN, The national university of defense technology, HONG GUO, Peking university — We theoretically and experimentally investigate wave front distortion in critically phase matched continuous-wave (CW) second harmonic generation (SHG). Due to the walk-off effect in the nonlinear crystal, the generated second harmonic is extremely elliptical and quite non-Gaussian, which causes a very low matching and coupling efficiency in experiment. Cylindrical lenses and walk-off compensating crystals are adopted to correct distorted wave fronts, and obtain a good TEM_{00} mode efficiency. Theoretically we simulate the correction effect of 266nm laser generated with SHG. The experiment results accord well with theoretical simulation and above 80 percent TEM_{00} component is obtained for 266nm continuous wave laser with 4.8 degree walk-off angle in BBO crystal. After that, an optical mode cleaner is used to obtain an ideal Gaussian mode. With these treatments, the generated second harmonic can be utilized in continuous-variable regime, where almost perfect mode matching is demanded.

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