**Tunable Ce:LiCaAlF₆ and Ce:LiLuYF₄ solid-state lasers**

### Benefits
- Continuous tuning in the ranges 280 nm – 317 nm and 304 nm – 334 nm (according to active element)
- High stability of laser emission parameters
- Operation at high repetition rates (hundreds of kHz)
- Short pulses generation option (hundreds of picoseconds)
- Short pulses amplification (femtoseconds)
- Independent on temperature, no cooling needed
- Low cost of tuning automation (+ 20 % of price)
- Easy to use

### Physical principles

- Lasing transitions — 5d-4f transitions of Ce³⁺ ions in fluoride crystals
- Electrical-dipole allowed
- Localized in UV and VUV spectral ranges
- High fluorescence quantum yield
- Wide bands (40 nm due to vibronically broadened)
- Significant Stokes shift
- High values of working transitions cross-sections
- Degradation excluded of active medium due to wide band-gap and inhibition of photodynamic processes

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**Tunable Ce:LiCaAlF₆ laser**
- Output UV laser oscillation with tuning from 280 nm to 317 nm;
- Pumped by 266 nm (4th harmonic Nd:YAG) or any pulsed lasing of the range 250–270 nm;
- Amplifies ultrashort pulses of UV spectral range;
- Scales power of laser output up to destruction threshold due to:
  - amplification stages arrangement;
  - pulse shortening;
  - Independent on pump source characteristics.

**Tunable Ce:LiLuYF₄ laser**
- Output UV laser oscillation with tuning from 304 nm to 334 nm;
- Free from solarization;
- Pumped by 297 nm (LiCAF) or any pulsed lasing of the range 240–255 nm and 290–305 nm;
- Amplifies ultrashort pulses of UV spectral range;
- Scales power of laser output up to destruction threshold due to:
  - amplification stages arrangement;
  - pulse shortening;
  - Independent on pump source characteristics.
Fluoride crystals for active and passive optical elements

Ultraviolet Solutions company offers wide range of crystalline compounds of fluorides, pure and doped with various rare earth and transition metal ions. Crystals for laser active media, with high active ions content (up to 4 at. %)

**IR spectral range**

**Rare-earth doped**
- LiYF₄
- CaF₂ – YF₃
- BaF₂ – LaF₃
- Na₄YF₁₂

**Transition metal ions doped**
- MgF₂
- KMgF₃
- KZnF₃

**UV spectral range**
- Ce:LiLuF₄
- Ce:LiLuF₄
- Ce:LiCaAlF₆
- Ce:LiSrAlF₆

**Novel active media for UV spectral range**
- Ce:XYF₄
- Ce:BaYF₄

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**Tunable**

Ce:LiCaAlF₆ and Ce:LiLuYF₄ solid-state lasers

*The new class UV lasers*