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**Short access time acousto-optic deflector based on two cascaded**  
**Paratellurite devices**

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Acousto-optic deflectors (AODs) are used in many applications requiring optical scanning devices with various specifications regarding access time, resolution and wavelength. High time-bandwidth products can be achieved with AODs made in a tellurium dioxide (TeO<sub>2</sub>) crystal. As paratellurite crystals are available with relatively large dimensions, the time-bandwidth product can be increased by enlarging the optical aperture. However, the access time is increased which is not suitable for random access scanning mode. A new laser scanning system is then presented based on two wide-band paratellurite acousto-optic deflectors. Anisotropic interactions take place under two different tangential phase matching (TPM) configurations in such a way that the acousto-optic bandwidths add up. The optical arrangement of the two cascaded AODs is detailed. The feasibility of such a cascade deflection system has been demonstrated for the green wavelength  $\lambda = 514$  nm of an argon laser. The total frequency bandwidth is  $\Delta f t = 100$  MHz, equally distributed between the two acousto-optic deflectors. The total angular scan at the output is  $\Delta \theta t = 4.5^\circ$  leading to more than 120 resolvable spots for a 1 mm truncated Gaussian beam and a short access time (as low as  $1.5 \mu\text{s}$ ).