

Abstract Submitted  
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**Electro-optically tunable compact terahertz source** DONG WU,  
Naval Research Laboratory — The promise of terahertz technology for surveillance  
and reconnaissance applications is huge. Despite the technical advantages, the ma-  
jor challenge today in terahertz technology is the development of a portable high-  
power terahertz source. Of the several available terahertz source technologies those  
based on the difference frequency technique are very promising, as they can pro-  
duce a relatively high power terahertz beam over the frequency from 100 GHz to  
3.5 THz, which is tunable. However, earlier this technique suffered from a high  
loss of terahertz signal, and produced a weak terahertz beam, in part due to a  
large impedance mismatching. Also its frequency tuning was cumbersome and its  
tuning range was limited since it was typically performed by rotating a nonlinear  
optical crystal against the pumping beam. In our recent experiments we modified  
the technique to improve the impedance matching and to replace the mechanical  
tuning with an electro-optical tuning. With this new technique we demonstrated a  
terahertz beam output power exceeding 10 mW (occasionally  $\sim 100$  mW) at fre-  
quencies around 1 THz. Our new technique the frequency tuning is very convenient  
and not limited by the geometry of the experimental set up. Detailed experiments  
and experimental results will be discussed

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