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Abstract:

The hydroxyl radical (OH) gas, a reliable tracer of H$_{2}$ gas, is generally detected through absorption at a wavelength of 18-cm in the radio band. OH absorption lines are of particular interest since four 18-cm transitions yield measurements of the fundamental constants at large look back times, without the line-of-sight issues which plague current state-of-art UV/optical data. However, so far, only six OH 18-cm absorption systems have been found at cosmological distances. In this proposal, we want to carry out a pilot survey with FAST of OH 18-cm absorption lines towards five sources that have been detected in HI absorption with $\tau_{\rm HI,peak} \ge 0.1$. Additionally we want to observe one other source with relatively high optical-near-infrared (V-K) color. Our main aims are: 1), significantly increase the number of known OH absorbers, after three decades of searches; 2), to test the correlation between the OH 18-cm absorption strength and V-K colour; 3), to constrain the fundamental constants; 4), to detect the possible OH masers. We request 13 hours including the time for overheads.