# Some more HFO

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- mixtures
- The goal is to estimate the improvement on the limit estimation with hydrogen content with a non flammable mixture



- Measurement at CERN with MANGO and spectrometer of the charge and light effective gain of He:CF<sub>4</sub>:HFO

Light yield for different HFO mixtures

Taking the maximum reached LY I estimated the reduction of light in terms of reduced energy threshold

Min DM mass with He is 0.697 GeV

IFO	E_thr (keV <sub>ee</sub> )	Min DM mass wit
0	0.5	0.316
1	1.12	0.516
2.5	4.45	1.697
5	13.2	inf
7.5	51.3	Inf
10	127	inf



- Limit estimation based on code developed by Stefano and me in the past
- Results of the Bayesian fit for the isobutane 2% case study with limited to no directionality (we are not expecting changes in directionality with HFO)
- Quenching factor and energy threshold included
- Background of 1200 events per year with 1 year exposure and 0.4 m<sup>3</sup>
- To compare, a limit with pure He:CF<sub>4</sub> and 0.2% of water was estimated

SI LIMIT



10<sup>2</sup> DM Mass (GeV/c<sup>2</sup>)

10

SI LIMIT



10<sup>2</sup> DM Mass (GeV/c<sup>2</sup>)



Very low mass (below 1 GeV) All interesting range (until 8 GeV)

Two ranges were considered

3% of total limit area



- Calculated in Log<sub>10</sub> to equally weight low to large masses and low-high cross sections
- Cross section capped at 10<sup>-30</sup>



### SD LIMIT AREA GAIN



there for a paper