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Some Ideas and Designs for Simplification of Cavity-Based Dark Matter Searches

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Some ideas and designs are reported here for simplified and modified resonant signal detection scheme to aid in cavity-based Dark Matter searches, especially for Skivie axions. An enhanced and more sensitive on-resonance signal detection scheme is proposed incorporating a modified Colpitts oscillator and simple read-out electronics which simplifies the electronics associated with usual DM search experiments. In addition, we suggest the use of Hallbach geometry magnets to eliminate the need for expensive and large electromagnets, which pose a number of problems including background noise and arduous handling. We hope that these ideas could be useful in improving and simplifying cavity-based cold dark matter searches.

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