

Last development of composite detectors is proposed for HEP application.

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Composite radiation detector consist of the scintillation particles distributed in optically transparent media. For the best scintillation light registration the fiber or plate readout technique is used. It is found that general light output in such detector can reach 80-85% comparing to single crystalline detector.

For HEP application both radiation hard scintillation powder (like garnets or silicates, for example) and optically transparent media (on the base on polysiloxane gels) were found. Preliminary tests confirmed the optical stability at polymer matrix up to 100 Mrad that significantly over plastic scintillators. Preliminary tests demonstrated the high radiation stability for composites itself too. Optimization of the particle size, their distribution along the optical media and light receiver (fiber) allows to modify detector parameters for different applications. The data/parameters for several combinations on the base on GGAG, YAG, YSO will be announced in this presentation.

Composites production technology allows to cover few crucial issues for HEP use. These are the low cost (not necessary to grow crystal) of scintillator, large area detector production (no limits from technology side), flexible and complex shape (due to optical media flexibility), industrial availability of all basic components.

Summary

Composite radiation detector consists of the scintillation particles distributed in optically transparent media. Preliminary tests confirmed the optical stability at polymer matrix up to 100 Mrad. Composites production technology allows to cover few crucial issues for HEP use. These are the low cost of scintillator, large area detector production flexible and complex shape, industrial availability of all basic components.

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