



NOTE ON KADYK' S SEPARATED BEAM

D. Berley

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We were asked to investigate Kadyk separated beam described in the 1966 Berkeley Book (UCRL-16830 Vol. 3 p. 213). The technology required to construct such an apparatus is many years off, and it is difficult for me to think about it in a realistic way. The idea will survive or be forgotten only on the basis of its cost.

Of the beams Kadyk proposes the least expensive is a relatively short one. To separate 100-GeV particles requires a beam length of more than 2 km and more than 150 feet of bending magnet. Assuming such a beam could use something like the 4 in. \times 12 in. Berkeley magnets which with power supply cost \$3000 per foot, the cost of bending magnet alone is \$450,000. There is no reason to suspect that the transport system is much more economical than the $\$1 \times 10^6$ per kilometer of linear proton beam. The transport system is then $\$2.4 \times 10^6$ which is not very different than the transport system for a 100-GeV/c rf-separated beam. I have not tried to design a system which would minimize the cost.

Considering the greater flexibility of an rf-separated beam, I think the rf beam is a superior choice.