

Salient Features of Unstable Super Gaussian Nd:YAG Laser

Output energy	360mj @ 1064nm 150mj @ 532nm 45mj @ 355nm
Pulse width	5 - 6 nsec (FWHM)
Spot size	5mm (FWHM)
Rep rate.	10 pps
Divergence	0.8 mrad
Energy stability	± 3% (Peak to Peak)

Gaussian order = 5) of 4 meter curvature separated by a distance of 0.4 metre. The peak reflectivity and spot diameter on the mirror are 30% and 2.2 mm respectively. Parameters of the laser output are shown in the table above. The main features of the laser are higher output energy and shorter pulse width hence high peak power, compact laser head, and smooth temporal pulse.



Near field spatial profile from VRM resonator configuration for Nd:YAG laser developed at CAT.

INFRASTRUCTURAL DEVELOPMENT

Energy recovery unit in air-conditioning system

In normal air-conditioning system, the heat load contribution because of fresh air induction is quite significant. This contribution becomes major if the requirement is for once-through system. The fresh air is most important factor to control & represents a major load factor which is 20 to 22% of the total heat load in normal A/C system. American Society for Heating Refrigerating and Air-conditioning Engineers in respect of Indoor Air Quality has categorically revised (upwardly) the fresh air induction quantity to control sick building syndrome & Building related illness of any air-

conditioned area. With this upward revision in fresh-air induction quantity, the higher energy penalty, because of more cooling, has become inevitable.

An "Energy Recovery Unit" has been developed at CAT, which extracts cooling from the waste exhaust air of the air-conditioned laboratory. Waste exhaust air which is at low temperature and with low relative humidity is made to pass through the evaporative section of this unit. Cooling medium (water in this case) in the evaporator section is cooled evaporatively with this waste exhaust air and is then made to flow through the heat exchanger. Fresh air which is at comparatively high temperature is passed over this heat exchanger, where it gets cooled by transferring its heat to cooling medium flowing through the heat exchanger. This way pre-cooling of fresh air before its induction in A/C apparatus is carried out with help of this energy recovery unit.



Energy Recovery Unit Developed at CAT

Precooling of fresh air with the help of energy recovery unit reduces load on system, which helps in down sizing (by 15%) the chiller unit along with its auxiliary system. Further, power consumption in operation of energy recovery unit is approx. one fourth of that of an A/C system required to produce same cooling effect. Thus overall operating cost also gets reduced. Advantages of ERU so developed are; that it helps in reducing the overall power consumption of an A/C system; and helps in down sizing the chiller units along with its auxiliaries.