

the portional wall of the cavity is equivalent to reducing the input energy to  $E_2$ . The laser works at point  $B'$  instead of point  $B$  due to shading the cavity, and output laser energy  $E_B$ , is smaller than  $E_B$ . Therefore the contribution measured by  $(E_A - E_B)/E_A$  for the portion is larger than  $(E_A - E_B)/E_A$ . Accumulation of this error makes the sum of all portion coupling efficiencies over 100%.

#### 4. Conclusions

According to the above calculations and analyses, we can conclude that

- (1) The fractions of total reflected energy from different reflection portions are not equal. The arcs corresponding to  $0^\circ \sim 90^\circ$  contribute 70% of total reflected energy, but the arcs corresponding to  $120^\circ \sim 180^\circ$  only contribute 15% of reflected energy although the latter receive 1/3 of total light energy.
- (2) The blockage of the lamp is the major factor influencing the coupling efficiencies. To reduce the diameter of the lamp can greatly increase the coupling efficiency.
- (3) The coupling efficiency will greatly increase if the cavity with one lamp and two rods is used (namely, each rod of two sides of the lamp is placed). The calculation shows that 30% ~ 50% will increase for the mentioned cavity comparing to the cavity with one rod and one lamp.
- (4) The method used to value the various portional coupling efficiencies by means of portional shading is also suitable for other cavities.

#### References

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#### ·产品简讯·

#### 掺铈磷酸盐玻璃激光测距样机实现测距

西南技术物理所研制的铈玻璃激光测距实验样机于6月4日进行测距试验,测程达2.21km。该样机结构紧凑,国内公开文献中未见报道,进一步的改进工作在进行中。1.54 $\mu$ m 铈玻璃激光测距机具有人眼安全,穿透烟雾较强,可室温下探测等优点,具有广泛的军事应用前景。  
(张向阳 供稿)