

**ON AN EMPIRICAL REGULARITY IN  
THE ENERGY SPECTRA OF SOME  
ODD-MASS NUCLEI**

A REGULARITY in the level spacing of some odd-A nuclei with 31, 33 and 37 neutrons has been pointed out by Wapstra.<sup>1</sup> It is the purpose of this short note to bring attention to a similar regularity in the spectra of some odd-mass nuclei with 51, 53 and 55 protons. In these nuclei the level spacing is found to obey the energy sequence given by

$$E = n^2 E_0$$

where  $n$  is an integer and  $E_0$  some basic energy value.

Table I shows this regularity rather well. The nuclei that show this regularity are Sb-121, I-127, I-131, Cs-131 and Cs-133.

TABLE I

$n$	Sb <sup>121</sup>		I <sup>127</sup>		I <sup>131</sup>		Cs <sup>131</sup>		Cs <sup>133</sup>	
	E <sup>51</sup> (Kev)	E <sub>0</sub>	E <sup>53</sup> (Kev)	E <sub>0</sub>	E <sup>53</sup> (Kev)	E <sub>0</sub>	E <sup>55</sup> (Kev)	E <sub>0</sub>	E <sup>55</sup> (Kev)	E <sub>0</sub>
1	..	..	..	..	..	..	..	..	..	..
2	70	18	57	14	147	37	124	31	81	20
3	..	..	..	..	..	..	216	24	160	18
4	..	..	203	13	600	38	372	23	380	24
5	..	..	370	15	..	..	620	25	440	18
6	576	16	418	12	..	..	1030	28	..	..

On account of the known spins of these levels, rotational description is ruled out. But the form of the regularity suggests, nevertheless, some form of collective effect in these nuclei. It would be interesting to find an explanation theoretically for this regularity.

Dept. of Physics, S. M. BRAHMAVAR.  
Karnatak University, M. K. RAMASWAMY.  
Dharwar-3, April 22, 1963.

1. Nussbaum, Wapstra, Proil, Sterk, Nijgh and Grobden, *Phys. Rev.*, 1956, **101**, 905.