Fourier Analysis and Representations of Translation Group

Bhargava Ram

September 12, 2004

Abstract

The kernel of Fourier integral transform can be seen as a translational operator acting on a function. I will talk about the structure of the one dimensional translation group first and then the n dimensional group in general. I will discuss the properties of the translational operators & construction of representations of this group from them. Further, it will be shown that they are irreducible representations and form an infinite orthonormal basis for the functions of real space.

References

(1)Wu-Ki Tung,*Group theory in Physics*, Philadelphia:World Scientific,1985
(2)G Arfken and H Weber,*Mathematical Methods for Physicists*, 5th ed., San Diego:Academic Press, 2001