1135-VN-655 **Kiwoon Kwon*** (kwkwon@dongguk.edu), 30, Pildongro 1gil, Jung-Gu, Seoul, 04620, South Korea, and **Sungwhan Moon**. *A numerical method for conical Radon transform with the vertices on a helix.*

Since a Compton camera, also known as an electronically collimated γ-camera, was introduced for use in SPECT, a Radon-type transform assigning the surface integral for a given function over various sets of cones has attracted much interest.

A typical Compton camera consists of a scattering detector and an absorption detector. The recorded energy in each detector gives us to know that the observed photon must have been emitted on the surface of a cone with the vertex on a helix $\mathbf{u} = (\cos u, \sin u, u)$, the central axis β, and the scattering angle ψ, which is called conical radon transform.

Our reconstruction of the density f from the conical Radon transform Cf is as follows:

Let $f \in C^\infty(\mathbf{R}^3)$ have compact support in the cylinder $\{\mathbf{x} = (x_1, x_2, x_3) : |(x_1, x_2)| < 1\}$. Then we have

$$f(\mathbf{x}) = \frac{1}{8\pi^4} \int_{S^2} \int_{\mathbf{R}} \int_0^\pi Cf(u, \beta, \psi) \frac{1}{\cos\psi(\mathbf{x} \cdot \beta - g_\beta(u))^3} d\psi dg_\beta(u) dS(\beta),$$

where $g_\beta(u)$ is some monotone function related with $k_\beta(u) = \mathbf{u} \cdot \beta$.

A numerical algorithm and simulation of this reconstruction formula is given. (Received September 18, 2017)