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Larissa Sbitneva* (larissa@uaem.mx), Facultad de Ciencias, UAEM, Av. Universidad 1001, Col. Chamilpa, 62209 Cuernavaca, Morelos, Mexico. *Generalized Bruck loops related to non-gyrocommutative gyrogroups and generalized symmetric spaces as the underlying geometry.*

As is well known now the underlying geometry of gyrocommutative gyrogroups introduced by A. Ungar is just the geometry of symmetric spaces.

It turns out that the corresponding algebraic structure is just a non associative structure, the so-called Bruck loop, or, equivalently, a left Bol loop with the Bruck identity.

Some examples of non gyrocommutative gyrogroups by A. Ungar correspond to the case when the gyrocommutative property is not valid. In order to construct an example of non-Bruck loop, T. Fogel applied the algebraic construction of inclusion of loops into groups which is due to L. Sabinin.

Following this construction for the case of smooth loops we present an example of a Generalized Bruck loop realized as a section (transversal) on some reductive homogeneous space, thus it may be considered as an example of a non gyrocommutative gyrogroup.

The so called Generalized Bruck loops are the left Bol loops which are not Bruck loop.

Smooth left loops with the Bol and Generalized Bruck identities originated in the theory of generalized symmetric spaces.

We also present the infinitesimal characteristics for some class of smooth loops generalizing Bruck loops to be embedded into a Lie group. (Received August 29, 2011)