The weight spectrum of certain affine Grassmann codes

We consider the linear code corresponding to a special affine part of the Grassmannian $G_{2,m}^m$, which we denote by $C^A_{2,m}$. This affine part is the complement of the Schubert divisor of $G_{2,m}^m$. In view of this, we show that there is a projection of Grassmann code onto the affine Grassmann code which is also a linear isomorphism. This implies that the dimensions of Grassmann codes and affine Grassmann codes are equal. The projection gives a 1–1 correspondence between codewords of Grassmann codes and affine Grassmann codes. Using this isomorphism and the correspondence between codewords, we give a skew–symmetric matrix in some standard block form corresponding to every codeword of $C^A_{2,m}$. The weight of a codeword is given in terms of the rank of some blocks of this form and it is shown that the weight of every codeword is divisible by some power of $q$. We also count the number of skew–symmetric matrices in the block form to compute the weight spectrum of the affine Grassmann code $C^A_{2,m}$.