On some classes of Deza graphs

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We consider only undirected graphs, without loops and multiple edges. Let Γ be a graph. We will consider the following generalization of strongly regular graphs. Let n, k, b and a be integers such that $0 \leq a \leq b \leq k < n$. A graph Γ is a Deza graph with parameters (n, k, b, a) if

(i) Γ has exactly n vertices;

(ii) $\Gamma(u, v)$ has exactly k vertices if $u = v$, takes on one of two values b and a otherwise.

The only difference between a strongly regular graph and a Deza graph is that the size of Γ (u,v), does not necessarily depend on adjiacences. These graphs were introduced in the article by Antoine and Michel Deza [1]. So we call these graphs as Deza graphs. A strictly Deza graph is a Deza graph which is not strongly regular and has diameter 2.

Significant results for a strictly Deza graphs have got by M. Erickson, S. Fernando,W.H. Haemers, W.H. Hardy, J. Hemmiter [2].

It is easy to see the complement of a strictly Deza graph is not necessary a Deza graph and not always has the diameter 2.

We consider some class of strictly Deza graphs according to the properties of their complement graphs.

References

[1] A. Deza, M. Deza, The ridge graph of the metric polytope and some relatives // Polytopes: Abstract, convex and computational, ed. by T. Bisztriczky [et al.]. NATO ASI Series, Kluwer Academic, 1994. P. 359–372.

[2] M. Erickson, S. Fernando, W. H. Haemers, W. H. Hardy, J. Hemmeter, Deza graphs: A generalization of strongly regular graph // J. Combin. Designs. 1999. Vol. 7, no. 6. P. 395–405.