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The full title of the paper

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Abstract: In this paper, we classify the simple uniformly bounded weight modules for the vector field Lie algebra W_∞ of infinite rank. It turns out that any such modules are intermediate series modules. This result is very different from the vector field Lie algebra W_d of finite rank.
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§1. Introduction

As usual, the set of all $m\times n$ nonnegative integral matrices is denoted by $M_{m\times n}(\mathbb{Z}_+)$. In particular, we shall use $M_n(\mathbb{Z}_+)$ instead of $M_{n\times n}(\mathbb{Z}_+)$. The operations $+$ and $\times$ on $\mathbb{Z}_+$ induce corresponding operations on nonnegative integral matrices in the obvious way. For brevity, we shall write AC in place of $A\times C$. It is easy to see that $(M_n(\mathbb{Z}_+),\times)$ is a semigroup. Other concepts such as transpose and block matrix are defined in the usual way. Unless otherwise stated, we refer to matrix as nonnegative integral matrix in the remainder of this paper.

The paper is organized as follows. In section 2, we ***. In section 3, we ***. In section 4, we ***.

§2. Some Examples

Consider the following global optimization problem:

$$\min_{x\in R^n} \ f(x) \tag{2.1}$$

where $f:R^n\to R$ is a continuously differentiable function and the gradient of $f(x)$ is bounded.
Definition 2.1. *The function $(u,v)\in(L^\infty(Q_T))^2$ is called a subsolution (a super solution) of problem (2.1) in $Q_T:=\Omega\times(0,T)$ if the following conditions hold:*

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(i) $u(x,t) \leq (\geq) 0,\ v(x,t) \leq (\geq) 0,\ (x,t) \in \partial\Omega \times (0,\infty)$.

(ii) $u(x,t) \leq (\geq) u_0(x),\ v(x,t) \leq (\geq) v_0(x),\ x \in \Omega$.

A vector valued function (u,v) is called a weak solution of (2.1) in Q_T if it is both a subsolution and a super solution for some $T > 0$.

Proposition 2.1. *If $(u_0,v_0) \in (L^\infty(\Omega))^2$, then there exists a constant $T^* < +\infty$ such that problem (2.1) has a weak solution in the sense of Definition 2.1 with T replaced by T^*.*

Lemma 2.1. *The W_∞-module $V_{\alpha,b}$ is reducible if and only if $\alpha \in Z^\infty$ and $b \in \{0,1\}$.*

Theorem 2.1. *Suppose that x_k^* is a local minimizer of problem (2.1), then x_k^* is a strict local maximizer of $P(x,x_k^*,f(x))$.*

Proof. Since x_k^* is a local minimizer of $f(x)$, there exists $\varepsilon > 0$, $\delta = U(x_k^*,\varepsilon)$, such that $f(x) \geq f(x_k^*)$ for any $x \in \delta$, then, for any $x \in \delta$ and $x \neq x_k^*$,

$$P(x,x_k^*,f(x)) = -\frac{\|x - x_k^*\|^2}{a + \|x - x_k^*\|^2} < 0 = P(x_k^*,x_k^*,f(x)). \tag{2.2}$$

Thus, x_k^* is a strict local maximizer of $P(x,x_k^*,f(x))$. □

(corollary, assumption, conjecture, remark etc. can be done similarly)

§3. Examples on Figures and Tables

3.1. An Example on Figure

The figure of the above Theorem 2.1 can be shown as follows:

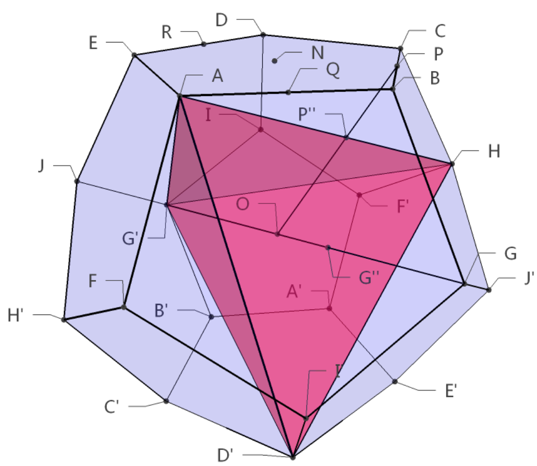

Fig. 1 The dodecahedron I fixed by $\mathcal{A}_\alpha$ and the tetrahedron T fixed by G.

3.2. An Example on Table

This example is an instruction to LaTeX to insert the current date at that point. You would usually use this in a draft article or report somewhere close to the beginning, sothat you have a record of when it was last typeset. You don't have to do anything else, although there are packages for changing the format of the date. The discussion of the range of possible values for the component index in this case is complicated and left. The results are the following.

Table 1 The existence of α such that $\mathcal{A}_\alpha \simeq D_n$, $n \geq 3$

Component Index	$(0,1,0)$	$(1,1,0)$	$(0,2,0)$	$(1,2,0)$	(ν,ϵ,k), $k \geq 1$
$n \geq 3, n \neq 4$	Yea(n)	Yea(n+2)	Nay	Nay	Yea$(2\nu+n(\epsilon+2k))$
$n=4$	Yea(n)	Nay	Nay	Nay	Yea$(2\nu+n(\epsilon+2k))$

Table 2 The existence of α such that $\mathcal{A}_\alpha \simeq D_2$

Component Index	$(1,0)$	$(2,0)$	$(3,0)$	(ν,k), $k \geq 1$
$n=2$	Nay	Nay	Nay	Yea$(2\nu+4k)$

§4. Concluding Remarks

Some conclusions should be stated here if needed.

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